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Copper and N. Rhodesia Share a Common Destiny

THE future of the Federation and of its copper mining industry have always been closely and inseparably interwoven. Today, anybody who is interested in the Rhodesian copper mining industry must be following with concern the slow progress of the talks on the new Northern Rhodesian constitution. The final outcome of these discussions must vitally affect the future of both the mining industry and the Federation. During the past week both Mr. Harry Oppenheimer and Sir Ronald Prain, respective chairmen of the two large Rhodesian copper mining groups, have given their annual addresses to shareholders. Both have pointed to the serious problems that lay before the Federation, yet both have expressed unequivocally their faith in its future.

Politically the problems of the Federation spring both from internal causes and from across the northern border—from the Congo. The direct threat of the hostilities in the Congo spreading are not great and, in any event, the troops of the Federation would be well able to handle this problem. What is more important is the continual threat of the spread of insidious propaganda across a frontier which is no more than an accident of history and is ethnically unreal.

The violence in the Congo has brought nothing but disease and discomfort to the indigenous population; but, to the militant leaders of African nationalism in the Federation, who have grown impatient with such tactics as passive resistance, the Congo is a constant reminder of the speed with which violence can bring results. That their belief in their own ability to control the situation and prevent a repetition of the Congo disasters is grossly optimistic seems clear enough to European observers but few of these new leaders have developed the powers of self-examination to the point where their own weaknesses are apparent. This lack of realism is the greatest threat to the Federation from recent events in the Congo.

Within the Federation, the immediate problems of Southern Rhodesia and Nyasaland have been overcome. In Southern Rhodesia Sir Edgar Whitehead has received the support of a largely European electorate for his advancement proposals and elections based on the new constitution will probably be held in 1962. In Nyasaland the recent elections were held in an air of comparative calm and today the Executive council is virtually controlled by African ministers.

Unhappily the new Northern Rhodesian constitution announced in June has yet to be finalised. At present the atmosphere is one of calm but the recent incidents of arson and violence in the Northern Province underline the suspense that prevails. The purpose of these outbreaks appears to have been to persuade authority to revise the terms of the new constitution and whilst the British Government cannot afford to appear to have been swayed by violence, it does serve to point to the urgency of making a decision and standing by it.

The conflict on this constitutional problem is not purely racial, there are considerable differences between the two leading African

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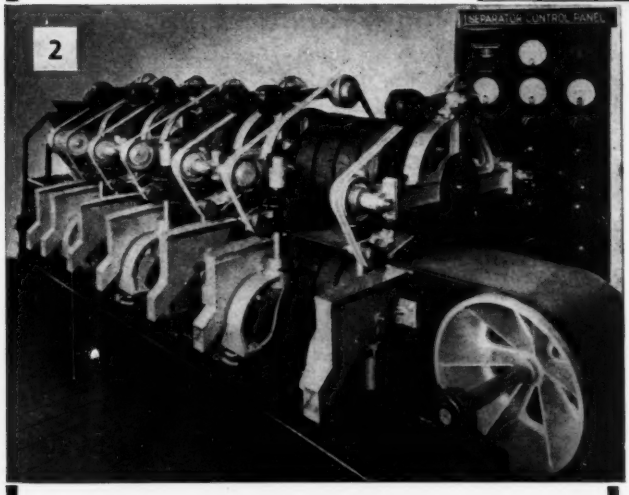

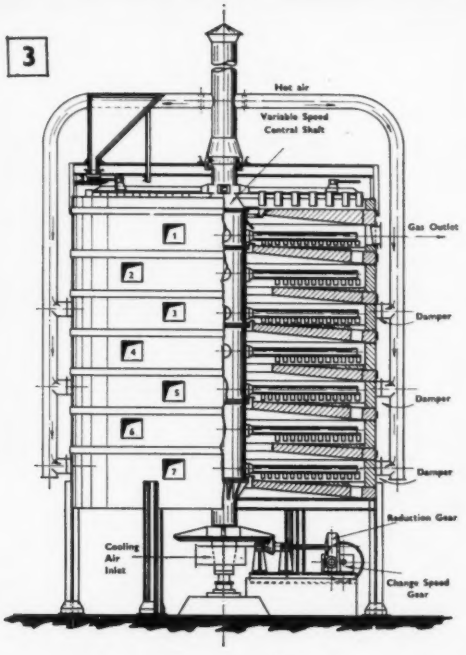

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parties, Kenneth Kaunda's U.N.I.P. on the one hand and the African National Congress on the other. Lawrence Katilungu's recent death is a loss to the cause of non-violence.

Notwithstanding the recent constitutional progress on Southern Rhodesia and Nyasaland, the future of the Federation depends to no small extent on the final outcome of the Northern Rhodesian constitution and in fact this Northern Territory must always be the greatest threat to the unity of the Federation. In the eyes of Northern Rhodesian African nationalists, their territory has the most to gain and the least to lose by severing its connections with the South.

The great strength of the Federation, by comparison with what the Nationalist leaders offer, is its ability to go forward with its plans for African advancement in the certainty that, within its framework, advancement—both economic and political—is already becoming a reality. It must, nevertheless, be recognised that in African eyes this is a slow process and that this "lack of time" is the Federation's main weakness.

Meanwhile, African advancement continues to move forward both in mining and secondary industries and in the public service. On the Copperbelt, the advancement proposals accepted by the European mine workers' union towards the end of 1960 are now being implemented. In these proposals, the principle of a unified wage scale was accepted and instead of certain jobs being "Africanised", the racial element of job reservation was removed and all jobs were open to both races on the basis of merit (see *Mining Journal* November 11, 1960, and March 3, 1961). Training courses have been set up and at present both European and African recruits are undergoing training—together. As yet, however, full agreement has not been reached with the African Staff Association and the African Mineworkers' Union on the questions of representation and wage levels.

This is not a serious problem in the sense that the whole African advancement programme need be jeopardised, but it does appear to carry the seeds of a labour dispute, which could, if not settled around the table, lead to arbitration. It is to be devoutly hoped that this problem can be settled on a purely industrial basis without interference from the nationalist politicians and at present it would appear that the African unions are not anxious for interference. However, it must be recognised that a good deal of political capital would be gained by the African nationalists if they could persuade the Unions to strike at a convenient juncture in the Constitutional talks.

Quite aside from its political problems, no less in Chile than in Central Africa, the industry has its marketing problems. In recent months the industry has shown itself increasingly alert to these and they have been the subject of close examination through the agency of the Copper Promotion Producers' Committee and its American counterpart, the Copper Products Development Association, in both of which the Copperbelt producers are active members.

In essence, the marketing problem is in two parts; the analysis of the world's future copper requirements compared with the industry's absolutely to expand within a stable price structure, and secondly the actual operation of the copper marketing machinery.

Many experts, including the Rhodesian companies themselves, have analysed the future trends of world copper consumption but these are essentially based on the natural growth factor consequent on increased population and increased living standards. What remains largely unknown, as discussed in *The Mining Journal* on January 20, is the additional growth factor that could exist following a serious campaign to promote further new uses for copper and a greater use within the traditional spheres.

Events may show that such a campaign could not be justified by the additional sales volume that would result, but it is both essential and urgent that this question should be resolved, for, if a potential does exist, it must be taken into account in the long-term planning of the industry's development.

Within the limits of the known possible copper reserves there must be an optimum rate of development for the copper mining industry. It may, in fact, be well ahead of the likely demand for copper, and if this is the case then demand will continue to be the controlling factor. However, until the potential of longer term product development and sales promotion is known this cannot be judged, and it is at least possible that, say after 1965, the industry's optimum growth rate will become the controlling factor, in which case a fully integrated production and sales policy should logically be implemented as soon as the facts are known.

Whether an integrated production and sales policy could, in present conditions, be implemented is open to doubt. For it to be successful it must operate on a world-wide basis and one of the major obstacles to such an international agreement is the American anti-trust legislation.

It is one thing for the American government to endeavour to protect its own citizens by anti-trust legislation. It is another to pursue the operation to the point which prevents American producers entering international commodity agreements, which aside from the benefits which price stability give to the consumer no less than the producer, must play a crucial part in the political evolution of the underdeveloped territories of which both the Copperbelt and the Congo are notable examples. Not only is the United States herself increasingly dependent upon the supply of metals from such territories but equally their political stability are basic to her foreign policy.

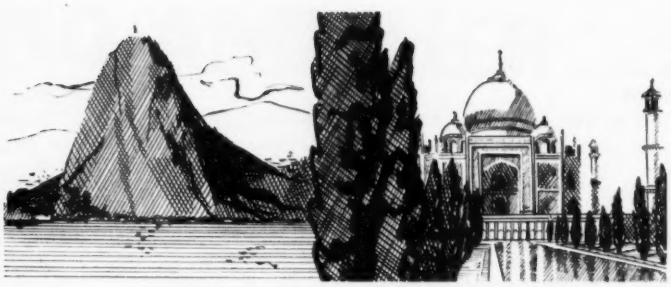
COPPER IN THE AUTOMOTIVE FIELD

Now that its availability is no longer in question, copper, with its outstanding combination of useful properties, should prove highly responsive to aggressive selling methods such as have been employed with such outstanding success by nickel in recovering the ground lost during the period of shortages and by the aluminium industry in its insatiable quest for further markets. As compared with the two newer metals, copper's salesmen have been slow off the mark, but latterly there have been growing indications of a new approach to the problems of marketing based on increasing emphasis on research and sales promotion.

An international programme for seeking new and improved uses for copper was outlined by the Copper and Brass Research Association at a recent meeting in Detroit, where a promotion office has been opened to serve as a two-way channel through which the research findings of the world-wide Copper Products Development Association can be made available to the automotive industry, and from which information regarding the special needs of motor car designers can be transmitted to the research association. Dr. Charles H. Moore, technical director of C.P.D.A., stated at the meeting that the overall effort to find new uses for copper started about 18 months ago, with an "almost unlimited budget". He had asked for and was granted $750,000 in the first year and this year's budget was $1,000,000. These figures, said Dr. Moore, represented merely the amount the association thought it could effectively spend in the initial stage of its programme, and he added that the industry's research development was expected to surpass the programmes of steel and aluminium.

Considerable attention is accorded in the C.P.D.A. programme to the utilisation of the catalytic properties of copper and copper compounds both to promote the efficiency

SPECIAL REPORT...



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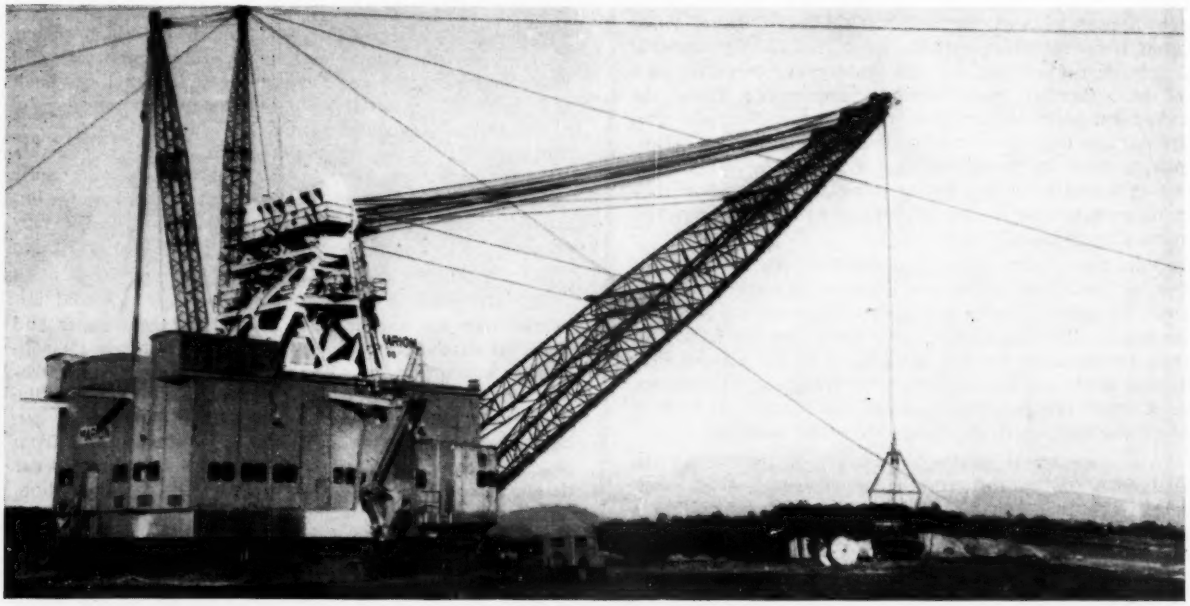

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of internal combustion engines and to decrease the hazards to health from exhaust fumes.

Dr. Moore spoke of three approaches to these problems, in each of which he claimed that surprising progress had already been achieved. One was an attempt to develop petrol-soluble organics to effect more complete combustion, thereby substantially reducing the carbon monoxide content of engine exhaust. The second project envisages the use of copper as an alloying agent with steel in the cylinder walls to retard corrosion and improve combustion. In the third place, $100,000 a year is being devoted to the use of copper as a catalyst in the muffler for the removal of hydrocarbons, nitric oxide and carbon monoxide.

Other research programmes having applications in the automotive industry were also cited. Among them is an effort to impart new characteristics and properties to copper products, including tarnish-free surfaces, ultra-high strength structures and electrically insulating copper composites. The hope was expressed that the time might not be far off when the development of a so-called stainless copper would "put copper and brass back in the trim on automobiles".

Also of interest to motor car manufacturers is a study of the use of copper for improving the physical and mechanical properties of cast iron and low alloy steels, seeking to develop high-strength, thin-wall cast iron for engine blocks that would weigh 30 per cent less than standard blocks. One of the most important improvements in grey cast iron through the use of copper as an alloying agent is a decrease in the tendency to chill. Such alloys would have better machineability, resulting in longer tooling life and, hence, lower production costs.

Copper, together with other traditional materials, has lost ground in the automotive industry, due, it is alleged by U.S. manufacturers, to laxness in research and development. Statistics issued by the Automobile Manufacturers' Association indicate that the weight of copper in the average U.S. car fell from 45 lb. in 1958 to 35 lb. in 1959. A study by the Copper and Brass Research Association in 1957 indicated that the potential use of copper products on the average car of that year could total 82.57 lb. Bearing in mind that in 1961 the U.S. automobile industry is expected to produce 6,000,000 cars, it is evident that here is a field where the benefits of C.P.D.A's. research programme could be particularly great.

DEVELOPMENT OF PANNA DIAMOND MINES

The National Mineral Development Corporation will shortly undertake systematic exploitation of the diamond deposits in Panna district of Madhya Pradesh, according to official sources. Two project reports for the exploitation of diamond deposits in the Ramkherya and Majhgawan areas in the district have already been prepared. The Ramkherya scheme is estimated to cost Rs. 4,600,000 with a foreign exchange component of Rs. 2,790,000. The annual output of diamonds is estimated at 12,500 *ratties*. The Majhgawan scheme is estimated to cost Rs. 9,000,000, its foreign exchange component being Rs. 2,900,000. The annual output of diamonds here is estimated at 30,000 ratties.

A sum of Rs. 1,244,000 has been spent on the Panna diamond project up to June this year and diamonds valued about Rs. 51,000 have been recovered during the period.

The National Mineral Development Corporation has also started detailed prospecting of the diamond-bearing area near Ajaigarh. The alluvial deposits at Saligpur and some new "pipes" recently located in the area have been sampled for diamonds on a fairly extensive scale.

In the meantime, the Geological Survey of India has carried out a preliminary reconnaissance survey of the diamondiferous belt in Kurnool district, in Andhra Pradesh. The survey was undertaken to plan detailed mapping and investigations by drilling during the Third Plan period.

The department proposes to undertake large-scale mapping with pitting, trenching, drilling, sampling, and washing for diamonds in the diamondiferous belts in the Kurnool, Mehboobnagar, Nalgonda, Guntur, Krishna and Anantapur districts of the State during the Third Plan period.

MINERAL PROCESSING IN SOUTH AFRICA

Some three decades have elapsed since proposals for the establishment of the Iron and Steel Corporation of South Africa (Iscor) were hotly opposed, one of the objections voiced being that it was impossible to make steel in the Southern Hemisphere! Iscor started production on an extremely small scale in 1934, its total output of ingots amounting in the first year to only 102,000 s. tons, but this modest beginning might be described, not inaptly, as the foundation on which the structure of South African secondary industry has been erected. By June, 1939, Iscor's annual production had risen to 344,700 tons. Last year, South Africa's total output of ingot steel amounted to 2,032,300 tons.

The Second World War, by interrupting the flow of supplies from overseas and at the same time creating an urgent need for an almost infinite variety of armaments and military stores, gave a new stimulus to industrial progress in which the processing of locally produced minerals played a basic role. This trend towards the more intensive exploitation of domestic minerals continued and indeed was accelerated during the post-war years, with the result that nowadays domestic sales account for substantial percentages of virtually all base minerals produced in the Union. In this respect South Africa is, of course, far ahead of the many less highly developed countries which have more recently adopted the now almost universal policy of fostering the establishment of industries based on the exploitation of domestic minerals, whether by utilising them as raw materials for local manufactures or by exporting them in more highly processed form.

As one means of easing her balance of payments problem, South Africa is now examining what possibilities might still exist for the more profitable exploitation of her mineral wealth. A statutory committee to investigate the desirability of processing certain South African minerals for export has been appointed by the Natural Development Resources Council. The committee is under the chairmanship of Dr. P. S. Rautenbach, Director of Planning of the Natural Resources Development Council. Its members include Mr. T. L. Gibbs, acting Government Mining Engineer; Dr. J. de Villiers, of the Geological Survey Section; Dr. R. E. Robinson, of the Government Metallurgical Laboratory; Dr. P. C. Carman, of the Council for Scientific and Industrial Research; and Mr. T. F. Muller, of Federale Mynbou.

In announcing the appointment of the new committee, Dr. Diederichs said that initially the investigation would cover asbestos, chrome, copper and manganese. He pointed out that the question of whether processing a particular mineral was practicable, or was in the best interests of the country, was often a complex one and might involve marketing as well as metallurgical difficulties. There might, for example, be a ready and profitable market for the raw material but no apparent market for the processed product.

Amendments to the Income Tax Act, introduced during the last session of Parliament, encourage the processing of minerals in South Africa by allowing the percentage of new capital written off against profits to reach 100 per cent, dependent on the degree to which the product mined is locally processed.

Metal Mining Developments in British Columbia

This survey is abstracted, by courtesy of the Board of Trade, from a Market Report by the U.K. Trade Commissioner, Vancouver, published in the Export Service Bulletin Weekly Supplement, **October 9, 1961**

BRITISH Columbia is predominantly a producer of metals—principally gold, silver, copper, lead and zinc. In 1960 the combined value of these five metals was $112,735,769, representing a gain of some $20,000,000 over 1958 and 1959 figures, and accounting for 60 per cent of the total value of the Province's mineral output. In the same year the value of other metals, including iron and steel as well as by-product metals (antimony, bismuth, cadmium, indium, tin, etc.) amounted to 10 per cent of the total value.

Extensive exploration work was carried out throughout the Province during 1960. Indications pointed to widespread prospecting and exploration in 1961 by a record number of large companies. Some 50 of the largest companies from Canada, U.S. and Britain, in addition to recently established companies from Japan, now have offices in Vancouver. Among the large Canadian companies active in this area are Ventures Ltd., Consolidated Mining and Smelting Co. of Canada Ltd. (Cominco), McIntyre Porcupine Mines Ltd., Noranda Exploration Co. Ltd., Bell Asbestos Mines Ltd., Conwest Exploration Co. Ltd., and recently Kerr-Addison Gold Mines Ltd. Copper companies from the U.S. include Kenco Explorations, Cerro Corporation, Newmont Mining Corporation, Phelps-Dodge, Southwest Potash, and many others. British capital is represented by such well-known firms as Yukonex Ltd. and Rio Tinto Canadian Exploration Ltd.

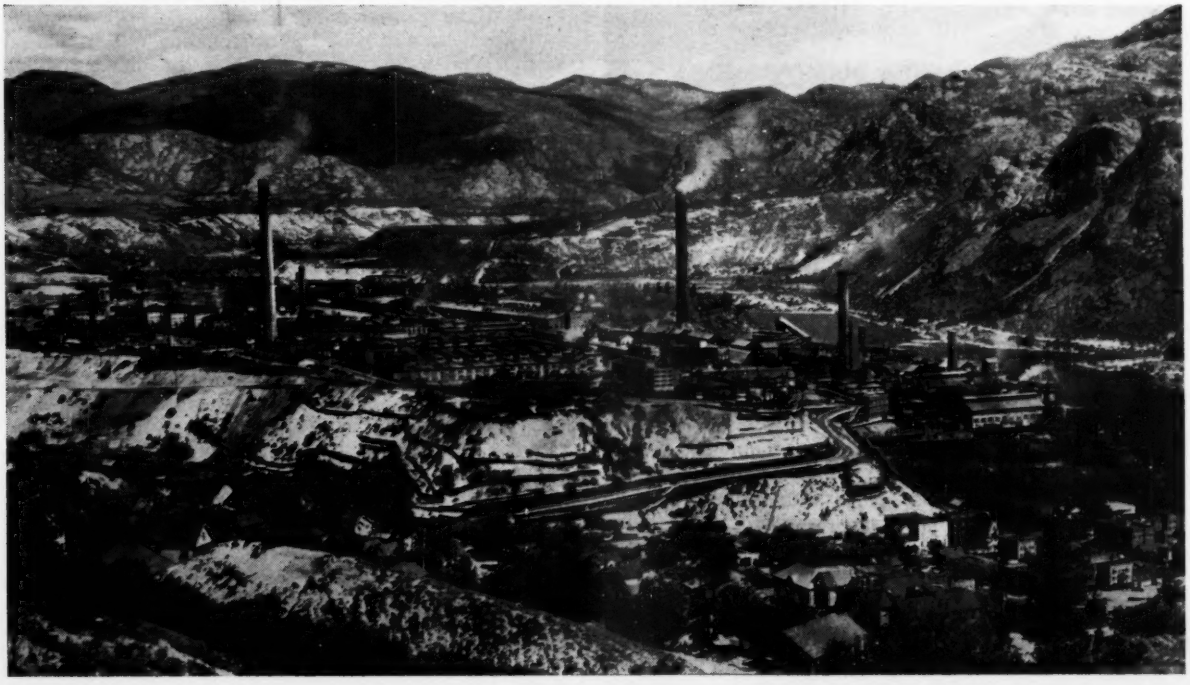
The most active Japanese firms are Sumitomo Shoki Kaisha Ltd., Mitsubishi Shoji Kaisha Ltd., Nitchimen Co. Vancouver Ltd., C. T. Takahashi & Co. Ltd., C. Ito & Co. America Inc., and Nogosho Co. Ltd. Recent purchases and assurance of continuing demand by these Japanese interests have spurred many projects to the production point and in many instances the new purchasers have supplied important development capital.

Iron Ore

The ore mined in British Columbia is of low grade and of no interest to Canadian and U.S. steel mills. The Japanese are reported to have developed methods of blending to make it a useful mill feed. It is concentrated by magnetic sorting to bring it to a minimum iron content before shipment. As a result of the opening of an iron ore trade with Japan plans have been announced for production from a number of deposits. At the present time three companies are shipping iron ore to Japan at a rate of over 1,000,000 t.p.a. They are Empire Development Co. Ltd., Vancouver; Nimpkish Iron Mines Ltd., Vancouver; and Texada Mines Ltd., Texada Island, B.C.

Empire Development Co. Ltd. operate the old Merry Widow and independent groups, in the Quatsino-Nimpkish area of Vancouver Island. In 1956 a contract was signed with Japan to supply 1,380,000 tons of concentrate over three years. In 1959 the contracts received from Takahasi were renewed for the supply of 1,250,000 l.tons over another three years, of which about 400,000 tons remain to be shipped. Operations of Empire Development are not expected to continue after completion of this contract unless a new zone to the north proves economically attractive.

The smelter at Trail



Nimpkish Iron Mines Ltd. are jointly owned by Standard International Mines, a Canadian subsidiary of Standard Slag Co. of Youngston, Ohio, and International Iron Mines, a Canadian company. They have a contract with Takahasi to supply 1,000,000 tons of iron ore concentrates, of which there remains only 400,000 tons to ship. Since the mine's known reserves were about 1,000,000 tons, it is not expected that Nimpkish will remain in production after completion of the contract next year.

Texada Mines, the Province's oldest producer of iron ore, are located on Texada Island in the Straits of Georgia. They have a contract with Mitsubishi International Corporation for three years to supply 1,400,000 tons of concentrates at a gross value of $14,000,000, expiring in 1963.

The company's ore reserves have not been disclosed.

Zebailos Iron Mines Ltd., was expected to bring its deposit at Zebailos on Vancouver Island into production at the rate of 3,000 t.p.d. towards the latter part of 1961. This operation is a wholly owned subsidiary of International Iron Mines Ltd., which in turn is backed by Japanese capital (Takahasi). In 1960, International signed a contract with Takahasi to supply 3,000,000 tons of iron ore from Zebailos over a 5-6 year period. The company is constructing a 3,200 ton mill at Zebailos and is expected to begin production in the autumn of 1961.

Another important development expected to get under way at an early date is that of Kennedy Lake Iron Mines, owned by Noranda Exploration Co. Ltd. This is a fairly recently discovered iron deposit on Vancouver Island where diamond drilling has indicated substantial reserves of high grade ore. Noranda will have spent some $5,000,000 to bring this magnetite deposit into production. It has signed a contract with Mitsubishi International Corp., and Gosho Co. Ltd., both of Japan, to supply 5,000,000 tons over seven years.

Some time ago Granby Mining Co. Ltd. took a three months option to study the possibility of bringing an iron ore deposit at Harriett Harbour on the Queen Charlotte Island into production. It has now signed an agreement to sell 2,000,000 l.tons of iron ore concentrates with an estimated value of over $18,000,000 to Sumitomo Shoji New York Inc. over a five-year period. As a result, Granby will exercise its option to purchase this property from Silver Standard Mines Ltd. Iron ore reserves have been estimated at 3,500,000 tons.

The market in Japan for magnetite ore will undoubtedly result in the continued exploration and development of iron ore deposits in British Columbia. Among outstanding deposits receiving attention are two properties owned by Ventures Ltd., one at Tasu Harbour on the Queen Charlotte Island (considered to be the largest and richest iron ore deposit yet found in the Province) and the other the Wadeen River deposit near Kitimat. Also noteworthy is the Bugaboo property at Port Renfrew on Vancouver Island, which is to be developed jointly by Noranda Exploration and International Iron Mines Ltd.; this is expected to be a 3,000 ton milling operation.

Recent amendments to British Columbia's iron ore legislation have facilitated the development of iron ore deposits. The Supreme Court of Canada ruled that the British Columbia Mineral Property Taxation Act of 1957 was invalid since the tax levied under it prohibited economic operation of iron ore mines and specifically excluded all minerals except iron ore. Later the British Columbia government passed legislation whereby a royalty, in lieu of a 50 per cent reserve, was placed on shipments from iron ore properties in certain areas.

In 1957 the provincial government passed an Act to provide a substantial bounty for the production of pig iron in British Columbia. A significant development since then has been the construction of a plant at Kimberley to produce pig iron from the iron content of iron sulphide used as a source of sulphur in the fertilizer plant there. The iron sulphide is a by-product of lead-zinc mining. The new plant began operation early this year; it is to be expanded and augmented by equipment for refining pig iron to steel and for rolling the steel. The Kimberley smelter is owned and operated by Cominco.

Underground spider's web during blasting operations at the Sullivan Mine at Kimberley

Gold and Silver

In 1960 British Columbia produced 202,822 f.oz. of gold, compared with 184,312 oz. in 1959. The gold was recovered from quartz veins, placer deposits, and from the treatment of base metal ores. There were four lode mines operating in the Province, namely: The Orham Mine near Wells, B.C., owned by the Cariboo Gold-Quartz Mining Co. Ltd., Vancouver; the Bralorne Mines Ltd. and Pioneer, which were amalgamated under one management in 1959; and French Mines Ltd. at Hedley, B.C.

Cariboo Gold-Quartz, British Columbia's veteran producer, was understood to have opened up an important new replacement ore body in the Wells area last year. Bralorne Pioneer Mines, whose operations are both located in the Bridge River area, discontinued production at its Pioneer Division mine at the end of the summer of 1960, but made an agreement with Ace Mining Co. Ltd. to participate in further exploration of the latter's property, also in the Bridge area. The Bralorne Division is meeting with favourable results in further exploration and is modernizing its mill.

Silver was expected to receive much attention during the remainder of 1961 and possibly well into 1962. Possibilities of an increased price has stimulated interest in some of the old silver camps and it is anticipated that some new developments will get under way.

Copper

The estimated output for 1960 was 16,000 tons, compared with 8,121 tons in 1959. The principal producers were Phoenix Copper Co. Ltd., a wholly owned subsidiary of the Granby Consolidated Mining, Smelting and Power

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Co. Ltd., of Vancouver, Consolidated Woodgreen Mines Ltd., which operates the Mother Lode open pit mine at Greenwood; and Howe Sound Co. Ltd.

The Britannia mine is owned and operated by the Howe Sound Co., of New York City, which ships concentrates to the smelter at Tacoma, Washington. There have been rumours of negotiations between this company and Japanese interests, but nothing has as yet materialized.

The Cowichan Copper Co. owns and operates the Blue Grouse mine on Vancouver Island. During 1960 it negotiated a deal with Cominco to operate the Sunro copper mine on Vancouver Island which will go into production shortly. This company has been shipping concentrates to Japan for some time and its contract with Mitsui was renewed in 1960, covering 27,500 s.tons to be delivered over four years.

The Japanese industry is seeking copper concentrates and its requirements have created a substantial market for the output of British Columbia mines. Some contracts are being negotiated, while others have been concluded. As a result two new copper mining operations will bring millions of dollars annually into British Columbia. One is the operation of Craigmont Mines Ltd. property near Merrit, B.C. which has already started up and the other is that of the Bethlehem Copper Corporation near Ashcroft, B.C., in Highland Valley.

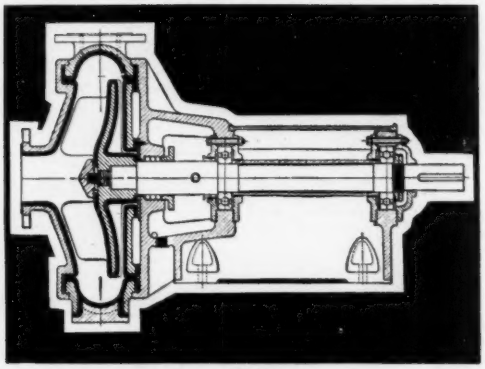
On June 1, 1958, Craigmont signed an operating agreement with Noranda Mines, Peerless Oil and Gas Co. and Canadian Exploration Ltd., whereby these companies would spend up to $1,000,000 over three years on development. In 1960 construction of a 4,000 t.p.d. concentrator was started. In March this year Craigmont Mines announced arrangements to obtain an additional $17,300,000. It was expected that production would be started in November this year. The total cost of putting the mine into production will be $20,000,000, but a conservative estimate of the ore reserves, grading over 2 per cent, at the current price, would bring a gross revenue to Craigmont of $264,000,000. Craigmont is reported to have held talks with American Smelting and Refining Co. and with three Japanese firms, but there has been no public announcement as yet of any contract.

Power drilling at Peace River Coal Mines Ltd.

In September, 1955, American Smelting & Refining Co. became associated with Bethlehem Copper Corp. in the development of its Highland Valley property, but in 1958 ASARCO terminated the agreement after spending approximately $1,200,000 on exploration. In 1960, after carrying out studies of the claims, Sumitomo Metal and Mining Co. agreed to finance Bethlehem to production in return for the right to buy all the concentrates for ten years, amounting to 120,000 s.tons valued at $76,000,000. In May this year it was announced that the Japanese government had approved the financing and market contract. The present plans are that production will start late in 1962 and in the first 3½ years will be at 3,000 t.p.d. rising to 5,000 tons.

Interest is also being maintained at several other properties because of excellent development results. Negotiations between Canam Copper Co. and Mitsui have reached the "letter of intent" stage. Canam Copper has obtained excellent underground results at its property near Hope and

Open pit operations at Copper Mountain



Efficient pumping without sealing water

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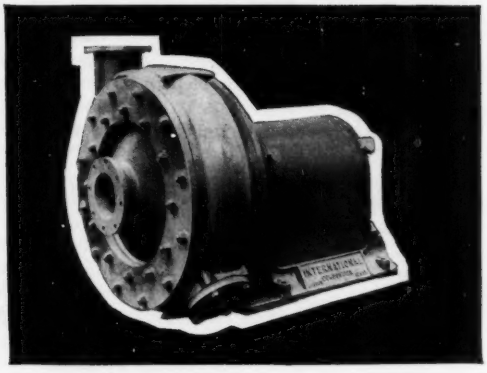

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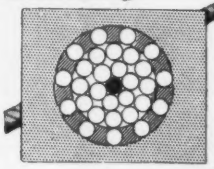

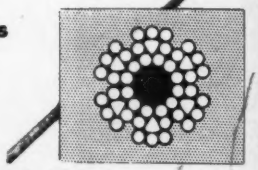

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now plans to install a mill. The company is being backed financially by Lorado Mines Ltd.

About $500,000 is being spent this year on exploring and developing the property of Granduc Mines Ltd. 25 miles N.W. of Stewart, which has an estimated 25,700,000 tons of ore grading 1.6 per cent copper. Some unofficial reports say that double this tonnage is now indicated. The operations are being financed jointly by Granby Consolidated Mining, Smelting and Power Co. and Newmont Mining Co. Ltd.

The Coast Copper Ltd. mine, located in the Quatsino area of Vancouver Island and controlled by Cominco, has concluded a contract with Mitsubishi and Dowa Mining Co. of Japan to supply 31,275 s.tons of copper concentrate over five years. Cominco started development of this old property in 1960 and a 750 ton mill is scheduled for completion early in 1962.

Exploration programmes are also under way at the property of Trojan Consolidated Mines Ltd. in the Highland Valley area, which is under option to Rio Tinto Exploration Ltd., and by Noranda Exploration Ltd. at the Mt. Washington property near Duncan on Vancouver Island; Cassiar Asbestos and Conwest Exploration have staked claims in the Liard River area; Kopan Developments have started an exploration programme on a large copper property in Vancouver Island.

At a recent session of the B.C. Legislature authority was provided for the government to bonus the production of refined copper within the province from B.C. copper ores. The amount the government is committed to pay is 1 c. per lb. on blister or refined copper.

Lead and Zinc

In British Columbia Cominco, Canada's principal producer of lead and zinc, operates the Sullivan mine at Kimberley and the Bluebell mine at Riondel, the H.B. mine near Salmo, and the lead and zinc refineries at Trail. Combined output of the three mines per working day is close to 12,000 tons of which about 9,600 tons comes from the Sullivan mine. Cominco is the only producer of refined lead in Canada.

Other important producers in British Columbia include the Jersey mine and 2,000 ton mill at Salmo, operated by Canadian Exploration Ltd.; the mine and 1,000 tons mill at Remac, operated by Reeves, McDonald Mines Ltd.; the Mineral King and 500 ton mill west of Invermere operated by the Sheep Creek Mines Ltd.; the Britannia mine, with a daily rate of about 1,200 tons, operated by Howe Sound; and the Highland Bell mine at Beverdale.

United Keno Hill Mines Ltd., Canada's main silver producer, also mines substantial amounts of lead and zinc ore from several mines in the Mayo district, of which the most important are the Calumet, Hector and Elsa, all in Yukon Territory.

The first Japanese purchases of British Columbia lead and zinc concentrates were announced in June, 1961. The contract is between New Ainsworth Base Metals Ltd. and Mitsubishi Co. Ltd. The Japanese firm has contracted to buy a minimum of 2,000 tons of concentrates. The agreement is reported to be a test and if plans now being made are completed, a group of small lead and zinc mines will band together to ship larger quantities under a single contract.

The Pride of Energy mine near Hope, operated by Giant Nickel Mines Ltd., is British Columbia's first and only nickel producing mine; it is now treating 900 tons of ore daily with heads approximating 1.25 per cent nickel and 0.40 per cent copper. A single concentrate containing both metals is exported to the Sumitomo Shoji Group's refineries in Japan.

METALS RESEARCH PROGRAMME BY THE U.S. BUREAU OF MINES

REPORTS recently received from the United States indicate the scope and direction of the research programme currently being undertaken by the U.S. Bureau of Mines. Some of these, particularly those devoted to the study and treatment of metals, are of specific interest.

Manganese : Research this year is being directed towards economic utilization of large low-grade and refractory resources. Studies by the Bureau seek the best process-resource combination for manganiferous materials of the Artillery Mountains of Arizona and Aroostook County, Maine. Other projects will evaluate processes best suited for recovering manganese from openhearth slags and from Cuyuna Range manganiferous materials of Minnesota. Laboratory-scale research on the smelt-quench-leach process for Aroostook silicate materials will end and researchers will make small-scale tests on applying direct acid-leaching to non-silicate Aroostook materials.

Using Georgia umbers as the raw material, other researchers will seek an economical "pickle-liquor" process. If successful, this will help solve a troublesome steel-mill waste-disposal problem as well as develop a source of manganese. The Bureau is engaged in developing statistical methods for estimating grade and tonnage of ore deposits, and for determining optimum size and number of samples required. The bond within and between minerals in rocks and ores will be studied in efforts to improve rock-breaking methods.

Other research will concern the reducibility of manganese and other slag-forming constituents in silicate systems, bacterial leaching of manganese from low-grade or off-grade ores, and a modified ammonium-carbonate procedure for recovering manganese from slimes and from Arkansas manganiferous limestone.

Aluminium : Four research centres of the Bureau have been assigned to conduct studies on aluminium and the recovery of alumina from low-grade aluminous resources. Operation of a laboratory-scale alumina reduction cell will be observed. The effect of such variables as electrolyte composition, current density, and anode spacing on operating efficiency will be investigated, and the cell reactions will be analyzed. The electrowinning of aluminium from aluminium chloride in low temperature fused-salt or organic electrolytes also will be studied along with the electrorefining of aluminium from crude alloys.

The Bureau will evaluate the recovery of alumina from low-grade domestic resources by processes for which pilot plant information is available. Reactions in the lime-soda-sinter process will be investigated by high-temperature X-ray diffraction methods.

Nickel-Cobalt : Recovery of nickel from lateritic ores, separation of nickel and cobalt, and recovery of nickel and cobalt from high-temperature alloy scrap are the primary points in research on these metals during the current fiscal year that began July 1. Work on separating nickel and cobalt by fused salt electrolysis is under way at the Bureau's Metallurgy Research Laboratory at Boulder City, Nev., meanwhile, the Salt Lake City Metallurgy Research Centre is studying a method involving a combination of aqueous electrolysis and solvent extraction.

Research on recovering nickel from lateritic ores, by a process involving high-temperature sulphatization of the ore followed by water leaching to remove the nickel sulphate thus formed, is being carried out at the Bureau's Minneapolis Metallurgy Research Centre.

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Developments in the U.K. Coal Mining Industry

MANY of the recent technical advances utilized by the National Coal Board have been developed within the departments of the Board or by individuals employed in the coal mining industry of this country. The following article offers some examples of these equipments.

Mine Car Loader

In the National Coal Board's Durham Division, a mine car loader which reduces the amount of degradation of coal at loading points has been designed.

Coal from the main conveyor belt is fed into a small receiving hopper on a scraper conveyor designed to deal with peaks and to feed the coal into a specially constructed hopper. The bottom strand of the scraper conveyor is used for the level filling of the hopper.

The hopper portion consists of an inner and an outer hopper, the whole being supported on load cells; the outer hopper is suspended on two hydraulic jacks so that when a predetermined amount of coal has been fed into the hopper they lower the outside container together with the coal into the body of the mine car—prepositioned below—at the same time as the scraper conveyor is stopped. On reaching the level of the downward stroke the doors on the outside hopper are automatically opened and the hopper withdrawn, leaving the coal in the mine car, and the hopper doors closed in the raised position. As soon as this position is reached the scraper conveyor motor is restarted and the cycle repeated. The mine cars are then moved forward on a feeder so that the next car is positioned.

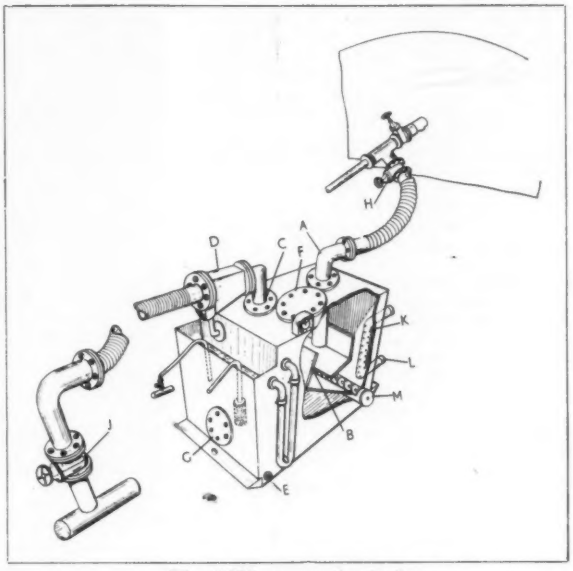
The whole cycle of loading a three-ton mine car can be achieved in 10 to 12 secs. By enclosing the top of the hopper and the scraper conveyor the dust nuisance can be considerably reduced. This system enables mine cars to be loaded with the correct amount of coal, eliminates spillage and provides opportunity for automation: the main conveyor could run continuously while cars were available for filling. Positioning cars under the hopper can be done by means of track switches. The loading point can be designed to suit individual car sizes.

A modified scheme being considered incorporates a chain belt feeder which moves over the length of the hopper at fixed intervals, the interval being decided by the operation of a coal level control fixed on the underside of the moving conveyor, the conveyor being arranged so that the hopper is fully loaded when the conveyor reaches the limit of its travel. While the mine car is being loaded the conveyor is returned to its original position. The movement of the conveyor is controlled by a hydraulic ram.

Drilling Separator Tank

When a borehole is drilled in a mine for firedamp drainage purposes, sudden heavy emissions of gas occasionally occur while drilling is in progress. A method has been required of collecting the gas coming from the borehole and leading it away in a pipeline without interfering with the drilling operations, and also of enabling the flushing water used for drilling to be in a closed circuit.

To meet these requirements a separator tank has been designed by the National Coal Board's Ventilation Branch. Its purpose is to separate the flushing water, gas and drillings discharged from a borehole. The return flushing water, cuttings and firedamp enter the tank, which is 4 ft. 6 in. long, 2 ft. 3 in. wide, and with an overall height of 4 ft., at the inlet A which is connected to the outlet of the stuffing box by means of a suitable length of hose.



The drilling separator tank

The cuttings settle to the bottom of the enclosed section of the tank, while the flushing water flows over the baffle plate B, through the U-tube assembly to the open section of the tank. Firedamp is drawn from the enclosed section of the tank through the outlet C and the water separator assembly D, and then via a flexible connection to the firedamp drainage range.

The suction hose of the water flush pump is inserted into the open section of the tank while the delivery hose of the pump is connected to the drill water swivel assembly. Make up water can be added as required to maintain the recommended level. The U-tube assembly provides a 27 in. water seal between the enclosed and open section of the tank. A pressure gauge having a range +3 to −3 p.s.i.g. indicates the pressure of the gas in the enclosed section of the tank. A drainage plug E and inspection plates F and G are provided.

Cuttings are removed from the tank by means of a scraper after drilling has finished and when valve H and valve J have been closed. Before the cuttings are removed the water in the enclosed section is drawn off through the small perforated pipe K by opening valve L. The screw cap M is then removed and the cuttings can be raked out.

Remote Control of Hydraulic Chocks

To prevent the risk of accident when operating Gullick 6-legged hydraulic chocks, a remote control system of operation has been devised in the East Midlands Division.

In using the system it is possible to lower, advance and reset the support from an adjacent support, hence eliminating any risks involved when carrying out the operation from underneath the support. All that is required additionally is a hose and distributing block in each chock circuit. Each chock leg is coupled to one of the ports in the distributing block and a hose taken from this block to the operating valve gear on the adjacent chock. All the chocks are connected in this way so that the operation of any chock is made possible by using the adjacent valve gear.

The operation of any one chock is thus obtained from an adjacent chock which provides operator safety.

MINING MISCELLANY

Iranian Chrome for Japan.—Final agreement on the import of 2,250 tons of chrome ore from Iran has been reached between the Iranian government and Japanese ferro-alloy manufacturers, and the formal import contract was expected to be signed shortly. The Iranian side agreed to reduce its export price of chrome ore to Japan by U.S.$3, to $30 per ton, for the lower grade, and $33 for the ore of 46-48 per cent chrome. Iran had originally asked Japan for export agreements covering 10,000 tons.

Kashmir Bauxite Development.—A bauxite development corporation is to be set up in Kashmir, according to the *Eastern Metals Review*, where it is estimated that some 11,800,000 tons of bauxite are available in the Jangalgali coal belt in Jammu province. The State government has approached the National government to erect a big hydro-electric project at Salal in the same area.

Canadian Molybdenum Exploration.—Noranda Mines is to carry out an exploration programme at its Boss Mountain molybdenum property in the Cariboo district of British Columbia, at a cost of $600,000. Surface drilling undertaken so far indicates the presence of over 1,000,000 tons of ore grading 0.95 per cent molybdenite to a depth of 500 ft. Underground exploration is being under taken to confirm these results.

Finnish Nickel output up.—During 1960 about 320,000 tonnes of nickel ore was mined in Finland, and 1961 figures are expected to be 30,000 tonnes higher. Concentrate from this ore yields some 2,000 tons of nickel a year, of which 90 per cent is exported. During the first eight months of 1961, 421 tons went to the U.K., 153 tons to Belgium-Luxembourg and 150 tons to Poland.

Iron Ore in Guatemala.—Reports have appeared in the Guatemalan Press of the discovery of an iron ore deposit, said to be extensive, in the Province of Chiquimula. The deposit is claimed to be capable of yielding 100,000 tons of ore annually, and an investment of 26,000,000 quetzales will be made for exploitation.

Superphosphate Plant for Colombia.—The Instituto de Fomento Industrial is to install a plant for the manufacture of triple superphosphate, according to a report in the *Bank of London and America Fortnightly Review*. Tenders for a study of the project have been invited from firms in Italy, W. Germany and the U.S. The plant will have a capacity of 100,000 tons.

Bell Bay Output to rise.—Comalco Industries Ptv. plans to increase aluminium output at the Bell Bay plant in Tasmania beyond rated capacity. Output will be increased by 25 per cent over the 1960 figure bringing it to well over 14,000 tons. The new expansion would cost over £A7,000,000.

Ores from Macedonia.—The lead and zinc ore deposits in the Osogovska Planina range in Eastern Yugoslavia are to be opened up, with an expected initial yield of 220,000 tons of lead, zinc and pyrites ores annually. This will rise to 300,000 tons, and an eventual annual output of 250,000 tons of lead and zinc concentrate is anticipated.

Russian Coal search on Spitzbergen.—In addition to the oil exploration programme which Russian geologists are to conduct on Spitzbergen, Soviet prospectors are also searching for coal.

Uranium Mining Plans in Mexico.—Mexico is reported to be planning plants for two deposits, one at Cerro de la Cal in Durango State, and that of Sierra de Gomez, in Chihuahua State. Deposits estimated at 17,000 tonnes of uranium ores are also reported near Aldama, and deposits, whose size was not disclosed, exist in the Bermejillo and Santiago Papasquiaro regions. Present estimates put the amount of uranium ores in Mexican reserves at some 400,000 tonnes.

New Indian Minerals.—The Minister for Electricity, Mr. V. Ramiah recently stated in Madras that geological surveys had indicated deposits of copper, lead and zinc at Kallakurichi in South Arcot district.

Swedish Steel Products for Australia.—Associated Swedish Steels AB plans to form a subsidiary company with head office in Melbourne, to market its products in Australia. Previously Australian distribution was handled by Westeels Industries Ltd.

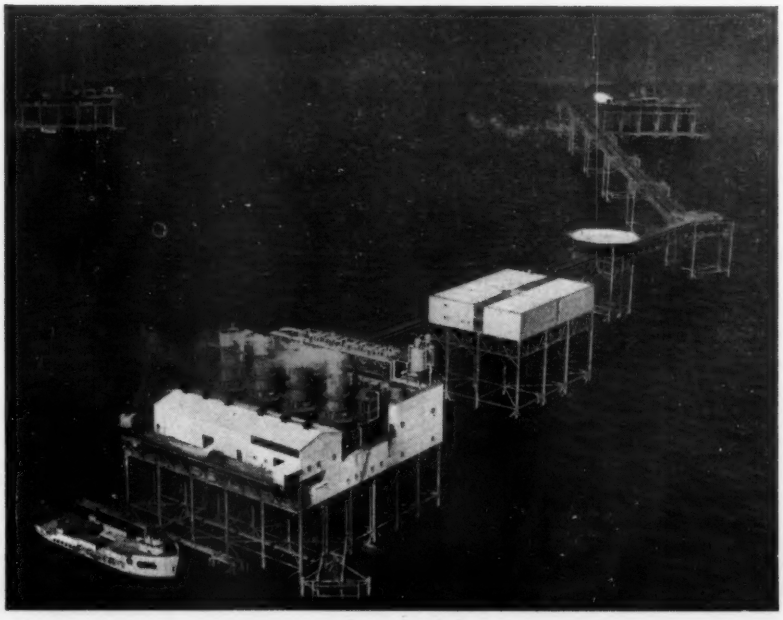
Mining Regulations in Surinam.—The Ministry of Development in Surinam has introduced a list of regulations to cover further bauxite mining in the Bakhuis Hills.

Indonesian Mining Projects.—Mr. Surodjo, of the Indonesian Mining Service stated recently in Djakarta that no contracts had yet been concluded on negotiations concerning possible co-operation by Japan in developing Indonesia's mineral resources, including nickel and bauxite, and the setting up of a manganese ore processing works. The Indonesian government is to send a team to survey nickel ore deposits around Pomala, in Celebes, and the construction of a processing plant was also being planned. The government hoped to mine 180,000 tons of bauxite annually, and refine it into aluminium in new Indonesian plants. The proposed manganese ore plant would refine metal now being exported from West and Central Java.

Russian Output of Artificial Diamonds.—The Ukrainian Research Institute of synthetic super-hard materials have produced 2,000 carats of artificial diamonds, according to a *Tass* report, which states that comparative endurance tests of diamond-polishing discs shows them to be 40 per cent tougher than the natural ones. In the near future it is expected that the Russian artificial diamond industry will supply all domestic needs.

Loan for French Aluminium.—A loan of New Fr. 110,000,000 has been floated to develop the French aluminium industry, which at the beginning of 1961 had a production capacity of 265,000 tonnes per annum. By the end of this year, capacity should reach 340,000 tonnes and it is eventually scheduled to attain 400,000 tonnes. Aluminium output for the first nine months of 1961 was 204,507 tonnes compared with 169,444 tonnes for the same period last year.

Freeport Sulphur Co. is to add a second production platform at Grand Isle, the world's first offshore sulphur mine. The extension, measuring 1,500 ft., will bring the overall length of the structure—already the largest steel island in the free world—to 4,076 ft., or almost four times the length of the Queen Elizabeth. The project, illustrated below, is located in 50 ft. of water seven miles off the coast of Louisiana. Commercial operation began in June 1960. The new platform, which is being erected in accordance with the original development plans, will make it possible to drill an additional 108 wells from the enormous steel island. Cost of the addition is expected to be about $3,500,000, thereby bringing the total expenditures for the project to approximately $30,000,000



Britain's only working salt mine was recently equipped with Atlas fluorescent lighting. This unusual installation—at the Meadow Bank mine of Imperial Chemical Industries Ltd., Winsford, Cheshire—is 400 ft. below ground level where 20 ft. high caverns are hewn out of the salt. Glittering pillars of rock salt provide local support for the roof—no artificial supports are used. Atlas Atlantic single 8 ft. batten fittings with anti-corrosive paint finish and starter switch control gear have been installed to light these caverns and roadways, and reflector type white fluorescent tubes are used throughout, thereby obviating the use of metal reflectors and their associated maintenance problems. Illumination level obtained is approximately 8/9 lumens per sq. ft.

Liberian Iron Ore.—New large iron deposits indicated during recent explorations in Liberia, and existing supplies, may make Liberia a leading supplier of iron ore within the next five years, and shipments could top 20,000,000 tons a year, according to the Bank of Monrovia. The U.S. imported over 400,000 tons of Liberian iron ore during the first seven months of 1961. LAMCO, in which Bethlehem Steel has a 25 per cent interest, expects to have an eventual output of 6,000,000 tons a year. German steel interests are also associated with Liberian ore developments.

Ghana Diamond Agreement.—The European licensed dealers in the Accra Diamond Market have agreed to pay one per cent of the value of their gross purchases to the Ghana Diamond Co-operative Union. In return, the Union has given up its dealer's licence.

French Uranium Output.—The production of uranium in France during 1960 was 1,068 tons. It is hoped that by 1962 production will reach 1,600 tons, and it has been forecast that by 1968 or 1970 electricity might be as cheaply produced by nuclear as by conventional methods.

U.S. Chilean Copper Talks.—High level talks between Chilean government mining officials and the heads of the big U.S. companies on the future of Chilean copper are expected to take place in Santiago shortly. One of the matters to be resolved is a proposal to repeal the Copper Workers' Statute, an appendix to the "New Copper Deal" law passed in 1955, which regulates relations between the unions and the mining companies. If it were repealed, copper workers would come under the full jurisdiction of the Labour Code, which only provides them with 6 per cent of the companies' profits, instead of 20 per cent as under the Statute.

New Mineral Plant in Derbyshire.—Laporte Industries Group is building a plant, in Derbyshire, claimed to be the most advanced mineral treatment plant in Europe, to begin production by mid-1962, with an initial annual capacity of 20,000 tons of acid grade fluorspar, between 6,000 and 8,000 tons of barytes and 1,000 tons of lead. A lorry load of crude ore will arrive every ten minutes and the plant will handle 50 tons of ore an hour (including part processing of the crude ore for the existing operations at the nearby Glebe Mines, also owned by Laporte). Core drilling is proceeding at Longstone Edge, in Derby, where Laporte state that considerable ore reserves are known to exist.

Patino Mines Indemnification.—Reports from New York state that negotiations between the Bolivian government and the Patino Mines for a final $4,500,000 cash settlement of indemnification seem to be standing still. Mr. A. B. Royce, vice-president of Patino, told a special stockholders meeting that it had been understood that the agreement on payment would be presented to the Bolivian Cabinet. But Bolivia's representatives submitted counter - proposals, and Patino, while accepting some changes in terms, opposed Bolivia's attempt to reduce the amount of the indemnification payable to Patino over an eight-year period.

G.E.C. Streamlines Exports.—In our issue dated November 10 we published an article announcing the formation of a new subsidiary of The General Electric Co. Ltd.—G.E.C. (Engineering) Ltd. We have now been informed that the new company comprises the electrical engineering works at Witton, Birmingham, and the mechanical engineering works at Erith, Kent. The total number of employees exceeds 15,000 people.

Mining Developments in India

The National Metallurgical Laboratory at Jamshedpur is studying the suitability of Nepal's raw materials, and trials with Nepalese ores have begun. The preliminary results are said to be encouraging, and it is reported that Nepal proposes to set up a small iron plant. The Laboratory has also carried out investigations at its pilot plant with iron ores employing non-metallurgical coals from Singareni coalfields in Andhra Pradesh.

★

It is understood that a plan to set up two more titanium dioxide factories in Chavara is under consideration by the Kerala government. British interests of the Trivandrum Titanium works have been asked to send a team of experts to study the new scheme, which envisages the establishment of plants in the production centres of ilmenite and monazite.

★

Vast deposits of limestone have been discovered near Jagdalpur in Bastar district, and near Singrauli coalfields in the Sindhi district of Madhya Pradesh.

★

A preliminary survey of the Chanda District by the Maharashtra government's geological department reports indications of diamond deposits at Wairagad near Armori, and the State government is to approach the Geological Survey of India for a detailed survey of the area. The report also notes the presence of high grade iron ore and coal deposits at a number of places in Chanda district. The coalfield near Chimur, which has so far not been exploited, is estimated to contain over 100,000,000 tons of coal reserves. A copper ore deposit is also noted, with one to five per cent metal content, at Thaneswasla in the Chanda district. Deposits are on both sides of the river Wainganga.

★

Rich deposits of metallurgical coal in the vicinity of the North Karanpura coalfields in Bihar have recently been discovered by the Indian Bureau of mines. Exposed in a *nullah* in the Chano-Rikba area, the seams are from 10 to 12 ft. thick. The continuity of the seams has been proved to extend over a large area. Another rich reserve is indicated from surface and sub-surface studies so far carried out in the eastern part of the North Karanpura coalfields. Beneficiation tests have yielded encouraging results.

★

Detailed geological mapping of the Umaria Johilla, Sohagpur and Konar coalfields in Madhya Pradesh has been initiated and the Singrauli coalfield is being prospected on a regional basis. The prospecting of the Singrauli coalfield has led to the discovery of the 96-feet thick Purewa seam. So far approximately 600,000,000 tons of coal have been proved in the two main seams occurring in this area. Simultaneously, the Indian Bureau of Mines is doing detailed prospecting in some of the Sonhat-Sohagpur coalfields. The Geological Survey of India has also undertaken a preliminary assessment of the bauxite reserves in Amarkantak plateau and the ridges north and south of the Johilla river, the limestone and corundum occurrences in Haspur in the Rewa district, and the sillimanite and corundum occurrences in the Pipri area.

Technical Briefs

Classification of Laminated Sheets

Rapid and accurate classification of mica, micanite, and other laminated sheets can now be made with an apparatus developed at the Central Glass and Ceramic Research Institute (C.G.C.R.I.), Calcutta. The development of the apparatus is of significance in view of the fact that India meets nearly 80 per cent of the world's total requirements of good quality sheet mica.

The quality of mica is generally evaluated visually on the basis of properties such as colour, waviness, and presence of stains and spots. Tests with the new apparatus developed at the C.G.C.R.I. revealed that visual evaluation was not a satisfactory method for determining the quality of mica and a correct assessment can be made only by determining its power factor.

The conventional methods of power factor determination are too slow and elaborate for commercial routine testing of mica sheets. These limitations have been overcome in the new apparatus which is portable, and battery-run and easy to operate. Test pieces of any size and thickness can be evaluated with this apparatus.

RADIOISOTOPES IN METALLURGY

Nuclear reactions triggered by alpha particles, gamma quanta and neutrons have been used successfully in the Soviet Union to control the process of enriching non-ferrous and rare metal ores.

This was announced by Professor Igor Plaksin at a recent Leningrad conference on the use of radioisotopes in the mining industry.

He said that the methods of control developed on the basis of these reactions made it possible to determine the content of elements in enrichment products within five to 15 minutes—dozens of times faster than by any other method. "This has provided the basis for the extensive automation of enrichment processes," he added.

Explaining the new methods of control, Professor Plaksin said that rapid analyses were made possible by the measurement of induced radioactivity, or the secondary nuclear particles produced in enrichment products by nuclear reactions. Nuclear reactions have also been used to determine the content of various chemical elements at the flotation stage.

UNUSUAL APPLICATIONS OF THE FLOTATION PROCESS

A review of flotation practice of more unusual application is included in Bulletin FIO-B104 of *Deco Trefoil*, published by Denver Equipment Co., United States.

The use of froth flotation techniques to process waste products from atomic reactors and fuel processing wastes is growing in importance. The application of the flotation process to an atomic waste problem was reported in 1957. A uranium fuel rod ruptured and scattered radioactive flakes of material in a "room-size" heavy water container. A flotation pulp containing forty gallons of alcohol, carbonated water and two pounds of oleic acid was prepared. The radioactive flakes were attached to the bubbles and lifted out from a multiplicity of tubing which lined the bottom of the container. This must be called a "non-selective" flotation process, but the desired result was obtained with a high degree of success.

Denver Equipment Co. has introduced a new laboratory flotation cell. It embodies many new advancements such as stainless steel suspended type mechanism, glass tank, positive speed control, aeration adjustment and safety mechanism lifting device. Above is the Model D-1 sub-A machines for batch tests of 250, 500 or 1,000 grams

The bulk flotation of oil from Canadian oil sands is an example of separation of a liquid from a solid by a froth flotation process. The removal of nonpolar oils, phenols, fatty acids, mercaptans and other organic chemicals from tank car waste solutions and slurries is an example of the separation of organic liquids from water with solid phase hydrocarbon (coal) acting as the absorbent and carrier.

At the Bitumount, Canada, pilot plant, the hot pulp was mixed in paddle mixers to break the oil film surrounding each sand grain. After the oil film is broken, a water film takes its place. The tiny oil droplets coalesce to form larger masses or drops of oil. Just before the mixed pulp was fed to the flotation cell, the oil, water and sand pulp was mixed with additional 200 degree F. recycle water. The violent agitation provided broke up any remaining lumps just before the slurry entered the flotation cells. The gently aerated flotation cells removed the oil as a buoyant froth that floated readily. The oil froth from the flotation cell contained 25 to 30 per cent water and 4 to 8 per cent mineral impurities such as clay and fine sand. This froth product was then refined by conventional oil refinery techniques.

In 1951 a most unusual industrial waste treatment plant began operations at Saegertown, Penn. The plant was designed for processing wastes from railroad tank car cleaning operations. Since over 700 different chemical products are transported by tanks cars, it is obvious that the wastes are complex and variable. The froth flotation section of the plant is used primarily to abstract nonpolar oils as well as phenols, fatty acids, mercaptans and almost any organic chemical with an acidic functional group. Minus 35-mesh bituminous coal is used as an absorbent. Coal feed rates range from 100 to 300 lb. per 1,000 gallons of waste. Some pine oil is usually added to stabilize the froth and pH is usually controlled to a value of 6.0 to 7.0.

The coal and its absorbed organic compounds are recovered as a heavy froth product from mechanically agitated flotation cells. The froth is filtered on a rotary filter and then dried and used as fuel. In this very unusual application of the froth flotation process, the mineral value (coal) is used to recover the organic compounds whereas in conventional mineral flotation, organic compounds are used to recover the minerals.

The flotation process has long been competitive with other unit processes for the separation and recovery of a multitude of inorganic chemicals. In some of the examples that follow, the separation noted may involve a true mineral specie, but most of the examples involve either an unusual mineral or a man-made chemical compound.

A flotation plant in Akranes, Iceland, processes a minus 28-mesh mixture of mollusk shell fragments and tuff to recover a froth product containing 90 to 95 per cent calcium carbonate. The unusual precaution of exchanging fresh water for sea water is required before the flotation step is attempted. The waste tuff product contains only 10 per cent calcium carbonate.

The Transwestern Pipeline Company utilizes a unique sulphur flotation step in its Italian-developed Giammarco-Vetrocoke process which scrubs carbon dioxide and hydrogen sulphide from natural gas. The plant utilizing this new process is located about 35 miles from Fort Stockton, Texas, and is the first in the Western Hemisphere. In the flotation step, elemental sulphur is removed from a chemical solution by a simple aeration step in two parallel "flotation towers". The sulphur-bearing froth is filtered and the filtrate is returned to the process stream.

Elemental sulphur is flotated from aragonite and gypsum gangue in an Egyptian flotation plant which uses sea water in the flotation circuit. The plant is operated by the Societe Egyptienne d' Engrais et d'Industries Chemiques at Ras Gemsa on the Red Sea coast.

Work by Belgian engineers showed that sodium nitrate can be separated from ammonium nitrate by froth flotation. The purity of the nitrate compound recovered was as high as 94 per cent sodium nitrate.

Froth flotation is used in a plant near Grand Junction, Colorado to reject

siliceous mineral impurities from gilsonite ore. The upgraded gilsonite ore is converted to gasoline and extremely low ash metallurgical grade coke in a refinery operated by the American Gilsonite Company. This unusual mining operation also utilizes hydraulic jet mining monitored by TV cameras and a 72-mile pipeline for transportation to the refinery near Grand Junction, Colorado.

Stephens patented a process for the production of ferric oxide compositions of rouge grade which utilizes a flotation step to reduce the carbon content to less than 0.15 per cent. The free carbon is removed as a froth product.

High-purity titanium carbide is separated from carbon and other impurities by froth flotation. The feed material particle size is substantially all minus five microns and kerosene is used as the flotation reagent. The beneficiated carbide product has sold for as much as three to five dollars per pound.

★

The use of radiant heat has been shown to increase the effectiveness of vacuum filtration by about 6 per cent when handling 14 mesh coal. The process lacks flexibility, however, since heat can only be applied for about one-third of the filter cycle but the economics appear to be sound.

The mechanics of such radiant heat application to a filter is a complex combination of both evaporation and lowering of the fluid viscosity although such a process is more in the nature of a filter aid than a thermal drier.

TWO METHODS OF COPPER RECOVERY

Ammoniacal - ammonium carbonate leaching of copper oxide and carbonate ore has been used with varying degrees of success for many years and since copper is dissolved readily, the method has possible application for treating segregation-flotation concentrate.

Laboratory scale tests by the U.S. Bureau of Mines on a segregation-flotation concentrate assaying 20.43 per cent Cu. indicate that it has possibilities (*Report of Investigations 5826*). Leaching a concentrate with a solution containing 900 lb. ammonia and 360 lb. of carbon-dioxide per ton of feed followed by washing the lead residues with 1.75 tons of a 10 per cent solution of ammomium carbonate and about one ton of water (as steam) per ton of solids, resulted in a copper recovery of 96.3 per cent. Resegregation and flotation tests of the washed residues revealed that 85 per cent of the copper in the residue could be recovered. Only 0.12 lb. of ammonia used per lb. copper recovered. The copper powder obtained by distilling the leach solutions and then reducing the copper oxide assayed 98 per cent copper and contained about 2 per cent of impurities.

The tests also suggest two fields of further investigation so as to produce a high purity copper. These involve purification of the leach solution before the copper oxide carbonate precipitation, and smelting tests on the precipitate to ascertain whether it is possible to slag minor quantities of impurities.

A process for recovering copper in the form of specification copper powders from Lynn Lake sulphidic copper concentration as well as from refinery by-product sulphide has been described in *Canadian Mining and Metallurgical Bulletin*.

The process consists of pressure leaching with ammonia, liquid-solid separation, distillation of residual ammonia, oxidation and hydrolysis to remove sulphur compounds followed by hydrogen reduction to obtain the metal powder.

The leaching of the chalcopyrite which also contains some intergrowth of pentlandite is carried out with ammonia and air at a temperature of 200 deg. F. and 100 p.s.i. and laboratory tests indicate a 12 hour retention time in a commercial plant when 98 per cent of the sulphur dissolves and the copper and nickel is in the form of metal amine sulphates. After removing excess ammonia the pulp is cooled and the liquid separated from the solid. Since the pulp contains a high percentage of hydrated iron oxide, filtration would be difficult. The pulp, however, appears to be readily flocculated by synthetic organic flocculants; countercurrent decantation would be practised in a commercial plant.

Following this liquid-solid separation, the excess ammonia was recovered and to avoid contamination with sulphur the unsaturated sulphur compounds oxidized with air and the sulphamate hydfolysed to sulphate. This is considered possible at 500 p.s.i. and at high temperature. After clarification, the copper is precipitated by autoclaving with hydrogen. Thereafter, by use of a number of batch reduction stages, as well as by lowering the free ammonia content by acidification, the copper can be separated from nickel and cobalt. A nickel-copper precipitate can also be prepared.

The copper metal carries a little basic sulphate and oxide which can be removed by an acid treatment to prevent any carryover of sulphur. When treating smelter residues, however, the process must be modified, adding some ammonium sulphate to make up for the stoichiometric sulphur defficiency and by using a higher pressure in the autoclaves. There is also no need for the oxidation and hydrolysis stages and reduction to copper metal can be carried out in the same manner.

Equipment Digest

A new range of screens has been developed by the Sinex Engineering Co. The new range is manufactured in standard sizes 4 ft. by 3 ft., 6 ft. by 3 ft., 8 ft. by 4 ft. and 10 ft. by 4 ft. They can be fitted with meshes profiled or fabricated screening decks and are powered by the latest type Sinex rotary electric vibrator in which all moving parts are totally enclosed within castings. These vibrators are fitted with adjustable amplitude weights and are of a design life tested for 5,000 hours between maintenance inspections. These screens are designed for use with vibratory chutes and can be interlocked with bunker vibrators to serve as vibratory feeders from bulk storage hoppers.

★

Electroweighers (B'ham) Ltd., have recently marketed control weighing equipment which functions as follows: Material A is weighed on an electronic continuous belt weigher. Signals from the weigher control unit are fed to an electronic sampler and memory unit. The delayed signals from the memory unit are then used to control the excitation of a vibratory feeder which supplies the required amount of material B on to another conveyor which carries materials A and B.

Technical details show that the belt weighing equipment comprises an electronic control unit and a weighbridge incorporating a linear inductive load cell which weighs material A. Voltage signals dependent on load are fed to a memory and sampler unit which registers average load and retains the signal for the requisite time period (up to 45 secs.) before operating a servo motor driven-toroidal transformer, the voltage output of which supplies variable excitation to the vibrator feeder which in turn varies the flow of material B.

The equipment can be used in any situation where mixing and blending are required.

★

A booklet published by Hilger and Watts Ltd. describes the manufacturer's direct reading spectrographs together with a wide range of alternative units. Descriptive contents include details of the three metre grading polychromator, medium direct readers, fluorite polychromator and other equipments.

★

The adsorption dryers by AEI-Birlec Ltd. were first introduced over twenty years ago for the removal of water vapour from the atmospheres required in heat treatment furnaces. The essential simplicity, economy and reliability of this method of gas drying has resulted in the development of many hundreds of other applications and Birlec adsorption dryers are now accepted by modern industry as essential equipment for avoiding water problems in the use of compressed air and other gases.

Today there is a comprehensive range of fully automatic and of manually operated Birlec adsorption dryers for compressed air and additionally there is a range of Birlec refrigerated dryers for the moderate drying which is acceptable for indoor or tropical installations.

The equipments are described in a publication recently brought out by the manufacturers. Adsorption dryers are normally rated for outlet dewpoints 32 deg. F. and 0 deg. F. (0 deg. C. and −20 deg. C.). Birlec dryers to dry further, even to −150 deg. F. (−100 deg. C.) are available. The RY range of refrigeration dryers give dewpoints above 32 deg. F. (0 deg. C.) and the RZ range, dewpoints below 32 deg. F. (0 deg. C.)

★

A versatile valve for the control of fluid flow, which is adjustable to provide a good range of flow characteristics, has been designed by two engineers of the U.K. Atomic Energy Authority's Capenhurst Works and is the subject of a patent application by the Authority. Further information is available from the Patents Exploitation Officer, U.K. Atomic Energy Authority, 11 Charles II Street, London, S.W.1.

★

Bestwall Gypsum Co. commenced operations at its New Orleans plant in early September. The $6,600,000 gypsum facility is the first on the Tidewater Ship Channel, a new, shorter channel from New Orleans to the Gulf of Mexico. The

channel will be usable for navigation by 1963 and completed in 1967. About 200,000 tons of gypsum ore will be imported by the new plant annually in ship cargoes averaging 14,000 to 20,000 tons.

★

The type 618 A.C. Milliclamp, by Dawe Instruments Ltd., is of value in alternating current measurement and waveform observation since readings can be taken without interruption of the circuit under test. The clip on probe gives fast operation and is especially useful for checking transistor circuits, current balancing in push-pull amplifiers and current observations where circuit considerations preclude the use of an earthed instrument. Used with a valve voltmeter, the type 618 covers measurements from a few hundred micro-amps to 10 amps r.m.s. and is operated from either self-contained dry batteries or a conventional mains.

★

New Idria Mining and Chemical Co., U.S., has announced plans to build a new refinery for the production of metallic tungsten and other tungsten chemicals. The new facility will process the company's own high grade ore as well as custom concentrates from both domestic and foreign ores.

The basic process and operational procedures were developed through a research programme requiring over a year for completion. Research on this project was successfully conducted by the Colorado School of Mines Research Foundation, Inc. in co-operation with New Idria and Stearns-Roger Mfg. Co.

★

I.C.I. has completed at Widnes, Lancashire, a plant to make 1.1.1-trichloroethane, a solvent not previously manufactured in the U.K. The new solvent will be sold under the trade-mark "Genklene", and extends the range of chlorinated solvents already made by the General Chemicals Division of I.C.I. "Genklene" is non-inflammable, of medium volatility and low toxicity and is, therefore, specially suitable for cold cleaning. It is likely to become widely used for cleaning machinery *in situ* without dismantling.

★

A fountain pen-sized "personal radiation monitor" that can be worn in the breast pocket, provides chirping sounds and light flashes that increase in frequency as the amount of gamma radiation increases. The wear-it-yourself radiation detector is manufactured by Nuclear Materials and Equipment Corp., U.S.

★

A Hungarian company, manufacturers of welding equipment, have brought out a fluorescent mining lamp, which is operated by compressed air, specially designed for use in areas where gas may be present. This lamp is described as giving more light than the usual forms of lighting, but needing less power.

★

To fulfil a requirement in industry for a chromating process suitable for large scale production, The Pyrene Co. Ltd. has introduced the Bonderite "250" series. The Bonderite "250" series of processes are designed to operate at room temperature and to produce on hot dipped galvanised steel, electro-zinc plated steel or zinc based alloys—chromate coatings which give considerable corrosion protection. The coatings also form an excellent surface for subsequent painting. The range at present consists of three processes.

Bonderite "250" is specifically formulated to produce a colourless coating with reasonable corrosion resistance, that would be particularly useful for preventing "white rusting" of articles during storage, and in other circumstances where a coloured film is considered undesirable.

★

The Ka-Mo G-16, a petrol-powered earth boring unit for drilling 2¾ to 12 in. holes, is the subject of a new four-page bulletin released by the Kwik-Mix Co., United States, a division of Koehring Co. The bulletin describes and illustrates the G-16. Included in the description are performance advantages and each major component is described in detail and a capacity chart, showing length and diameter of holes to be drilled with G-16, is also included.

★

A comprehensive range of literature describes the P.T.F.E. Hilfon hose and tape, and the Hilyn self-sealing swivel joint manufactured by William Rose Ltd. and the associated company Hilyn Industrial Equipment Ltd. The P.T.F.E. non-toxic thermoplastic material is resistant to most known chemicals, acids, alkalis, oils and corrosives, and it is claimed as impervious to water and steam.

★

The International Hough BH-70 Payloader currently in production at the Doncaster Works of International Harvester Co. of Great Britain Ltd., is a 105 h.p., four-wheel-drive tractor shovel of 7,000 lb. carrying capacity and can be equipped with a wide range of buckets for specialized purposes. The tractor is regularly equipped with torque converter and Paylomatic power-shift transmission providing three travel ranges, both forward and reverse. In addition to having a wide variety of earth-moving roles, the four-wheel-drive Payloader will handle a number of specialized material-handling jobs found in quarries, ballast pits, foundries, fertilizer plants and mines. It is well suited to all stockpile duties. The BH-70 Payloader is a completely new product.

The International Hough BH-70 Payloader

★

A new fire hose—it incorporates a woven all-nylon jacket to which is fused a lining of PVC compound—has been developed by BTR Industries Ltd. Called Plastiweave, this new hose is an addition to BTR's established range of hose specially-designed for fire-fighting purposes. Manufactured entirely from rot-proof water-repellent materials, Plastiweave can be successfully stored under the most adverse conditions. It provides an extremely light weight hose with comfortable non-slip handling properties, and meets JCDD specification for a nominal burst pressure of 500 p.s.i.

★

Griffin & George have produced a new set of analytical weights which, besides being of interest to educational authorities, can also be of great use to industrial laboratories for routine weighing. They are manufactured to the former N.P.L. Class B standard. The weights are of brass, finished tin-nickel plate and polished, and are of two piece construction. Tests carried out at the National Physical Laboratories have shown that the tin-nickel alloy finish has no undesirable magnetic properties and is resistant to corrosion by alkalis, nitric acid and other acids at normal temperatures. The alloy is also very hard wearing and does not tarnish.

★

The new Flat Transmission Belting catalogue issued by Turner Brothers Asbestos Co. Ltd., contains a considerable amount of information relating to the use of their square edge and rounded edge rubber belting, hammer mill and tractor belts, balata and fire resisting belting, and whipcord belts, which will be valuable to the flat transmission belting user.

Information is given regarding the use of belt fasteners, drive design, operation of flat belts, power capacity data and tables for recommended pulley diameters, number of plies required and arc of contact factors. Another useful table gives the circumference of pulleys for a given diameter. Copies of the catalogue, which is A4 size, can be obtained on request.

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COMPANY NEWS

Durapipe & Fittings announce that Mr. R. L. H. Damerham, technical director, has been elected chairman of the new Thermoplastic Pipe and Fittings Group of the British Plastics Federation. They also announce the appointment of Mr. D. C. B. Chandler as U.K. sales manager.

*

Smiths of Rodley have shipped a second M.E.11 truck crane to Burma, to meet an order from the Ministry of Defence, placed through Smith's agents, U. Aye & Co., of Rangoon. The crane has a lifting capacity of 10 tons at 8 ft. radius, with a basic boom length of 25 ft.

*

Among companies who sent engineers to this year's Maintenance Conference in London were: I.C.I., British Nylon Spinners; Imperial Smelting Corporation; The Steel Company of Wales; Colvilles; Dunlop; British Aluminium; Monsanto Chemicals; Guest Keen & Nettlefolds; Vickers Armstrong, and the U.K. Atomic Energy Authority.

DAVIES INVESTMENTS LTD., Private Bankers (Gross assets exceed £2,500,000), are paying 7½% p.a. interest on deposits for the **eighth** year in succession, with extra ½% added annually on each £500 unit. Details and Audited Balance Sheet from Investment Dpt., MN., Davies Investments Ltd., Danes Inn House, 265 Strand, London, W.C.2.

British Standards Institution announce that, in order to meet a rising demand their technical work, which has previously been handled internally in five sections, now has two extra sections. The new departments are concerned with (a) metallurgical and some engineering industries and (b) safety and consumer standards.

*

A complete modern mineral treatment plant, installed at the Avonmouth works of the National Smelting Co. Ltd., has been acquired for resale by George Cohen Sons & Co. Ltd., one of the 600 Group of Companies. The plant comprises a materials handling system followed by jaw, Kennedy, gyratory and rolls crushing equipment of large capacity, with materials storage and feeding plant to four rotary kilns by Ernest Newell.

*

BTR Industries have been awarded a contract to supply the N.C.B. with over 200,000 ft. of 2½ in. bore plastic fire hose for underground fire prevention purposes.

The Proprietors of British Patent No. 797472 are prepared to sell the patent or to license British manufacturers to work thereunder. It relates to "Improvements in and relating to Detonating Fuze Cords". Address: BOULT WADE & TENNANT, 112 Hatton Garden, London, E.C.1.

Metals and Minerals

A Set-back to African Bauxite

In February, 1960, it was announced in Paris that Aluminium Ltd. had started negotiations with other major producers to build a plant to produce 220,000 tonnes of aluminium annually at Boké, Guinea, where investigations by its French subsidiary Bauxites du Midi had established very large reserves of bauxite. In a statement issued some months ago, however, Aluminium Ltd. announced that Bauxites du Midi was suspending development of the project until financial difficulties had been worked out. A further announcement was made on October 27 when it was stated that the Guinea Government had asked the company to stop mining in Guinea within the next few weeks.

Now comes the news that the company has been directed to cease operations by November 23 and Alcan has been informed that the assets of Bauxites du Midi will be expropriated without compensation.

The cause of the trouble, it is disclosed, was failure to reach agreement with Guinea on the Boké project under long-term convention terms of May 17, 1958, which the government insists must be followed. Bauxites du Midi had told the Guinea Government that it was unable to complete the Boké project by July 1964, as foreseen in the convention, and submitted an alternative proposal which was refused. What, in fact, is really being expropriated are Bauxites du Midi's mining operations on the island of Kassa, Los Archipelago, where the rate of extraction and treatment has been of the order of 600,000 tonnes a year.

However, there is still time for second thoughts. The Government of Guinea has also stated that Bauxites du Midi's assets and position will be reinstated if the Boké project is revived before February 24, 1962.

Mr. Nathanael V. Davis, president of Aluminium Ltd., states that the company is now reviewing its position. He said that the company's investment in Guinea is about $23,000,000 (£8,170,000) and added that the loss of this investment could be properly chargeable against surplus account.

The Guinea Government's threat of expropriation is in marked contrast with the policy of seeking to attract overseas investment which, generally speaking, has so far been characteristic of the emergent nations of Africa. It is the more surprising in view of the present situation in the aluminium industry, where very large programmes are in progress throughout the world for the development of bauxite reserves, the setting-up or extension of alumina plants and the expansion of reduction capacity. In the neighbouring territory, Ghana, Dr. Nkrumah has had an extremely uphill struggle to secure the required capital for the Volta River project, arrangements for which have yet to be finalised.

It is, of course, conceivable though by no means probable, that the Guinea Government has the promise or perhaps the half-promise of financial and technical assistance from Russia. Even so, expropriating the undertakings of Bauxites du Midi without reasonable compensation would not only dry up the flow of risk capital for new ventures but might well have unfavourable reactions on Fria's future plans as well as on those of other international consortiums.

In view of the damage to Guinea's own interests which could be caused by any ill-considered action, second thoughts on the question of expropriation without compensation would occasion little surprise.

*

East European engineers and technicians will now mine bauxite from the Kassa deposit on Los Island, following the withdrawal of the concession from Bauxites du Midi, according to Guinean Government sources. The bulk of the bauxite will go to Poland under an agreement recently concluded between Guinea and Poland, states Comtel-Reuter.

NEW ALUMINIUM PROJECT FOR E.E.C.

An important project for the establishment of primary aluminium plants in E.E.C. countries has been announced. The president of Montecatini, Count Faina, has stated that his company is considering building a reduction plant in Sardinia with an annual output of 100,000 tons. Power would be derived from the new thermo-electric plant under construction in Sardinia, which will utilise lignite produced from the island's extensive deposits.

Kaiser Aluminium is also known to be interested in the plan for the construction of an aluminium plant in Sardinia and is understood to have offered to build it for a smaller sum than Montecatini's estimated cost of £20,000,000. Another of the major North American producers, Reynold's Metals, is interested in a plan for a second aluminium smelter, to be built near Trieste, and is reported to be negotiating an interest in it with the Italian state-controlled Finmeccanica Group.

A report from The Hague states that Holland's first aluminium reduction plant may be set up by N.V. Billiton Maatschappij, which is understood to be considering the establishment of an £18,000,000 plant in the extreme north of the country. An ultimate capacity of 60,000 tons per annum is mentioned in the report, which states that the decisive factor in this project could be the big reserve of natural gas found in Holland last year. In view of the very large bauxite concessions operated by this leading producer in Surinam, and of the company's policy of widening its interests to include undertakings associated with the raw materials it produces, the projected smelter appears to be a logical expansion of Billiton's activities.

The news of the new Dutch and Italian projects comes at a time when the aluminium industry in the Free World as a whole is operating substantially below capacity and when projects planned or in progress will result in a very large increase in capacity in the next few years. Twelve months ago Mr. Nathanael V. Davis, chairman of Aluminium Ltd., estimated that Free World primary production capacity would increase to 6,300,000 tons per year by 1965, whereas consumption was likely to reach only 5,000,000 tons. Quite a number of additional projects have since been announced.

The proposed Dutch-Italian plans are seen in proper perspective, however, in

LONDON METAL AND ORE PRICES, NOVEMBER 23, 1961

METAL PRICES

Aluminium, 99.5%, £186 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £230 per ton
Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 11s. 6d. lb.
Cerium (99%) net, £18 0s. lb. delivered U. K.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.
Cobalt, 12s. lb.
Germanium, 99.99%, Ge. kilo lots 2s. 5d. per gram
Gold, 249s. 9d.
Iridium, £20/£23 oz. nom.
Lanthanum (98%/99%) 15s. per gram
Magnesium, 2s. 2½d./2s. 3d. lb.
Manganese Metal (96%/98%) £275/£285
Nickel, 99.5% (home trade) £660 per ton
Osmium, £17/£22 oz nom.
Osmiridium, nom.
Palladium, Imported, £8 12s. 6d.
Platinum U.K. and Empire Refined £30 5s.
Imported £27 7s. 6d./£27 17s. 6d.
Quicksilver, £59 ex-warehouse
Rhodium, £43/£45 oz.
Ruthenium, £14/£16 oz. nom.
Selenium, 41s. 0d. per lb.
Silver, 80d. f. oz. spot and 80⅜d. f'd.
Tellurium, 37s. 6d. lb.

ORES AND OXIDES

Antimony Ore (60%) basis		28s. 0d./30s. 0d. per unit c.i.f.
Beryl (min. 10 per cent BeO)		270s./275s. per l. ton unit BeO
Bismuth		30% 5s. 0d. lb. c.i.f.
		20% 3s. 3d. lb. c.i.f.
Chrome Ore—		
Rhodesian Metallurgical (semifriable 48%)	(Ratio 3 : 1)	£15 5s. 0d. per ton c.i.f.
,, Hard Lumpy 45%	(Ratio 3 : 1)	£15 10s. 0d. per ton c.i.f.
,, Refractory 40%		£11 0s. 0d. per ton c.i.f.
,, Smalls 44%	(Ratio 3 : 1)	£13 5s. 0d. per ton c.i.f.
Pakistan 48%	(Ratio 3 : 1)	£11 15s. 0d. per ton f.o.b.
Columbite, Nigerian quality, basis 70% combined pentoxides (Ratio 10:1)		
	$Nb_2O_5 : Ta_2O_5$	150s./160s. 0d. per l. ton c.i.f. nom.
Lithium Ore—		
Petalite min. 3½% Li_2O		50s. 0d./55s. 0d. per unit f.o.b. Beira
Lepidolite min. 3½% Li_2O		76s. 0d./80s. 0d. per unit f.o.b. Beira
Amblygonite basis 7% Li_2O		75s. 0d./85s. 0d. per ton f.o.b. Beira
Magnesite, ground calcined		£28 0s./£30 0s. d/d
Magnesite Raw (gro d)		£21 0s./£23 0s. d/d
Manganese Ore Indian—		
Europe (46%-48%) basis 60s. 0d freight		73d./75d. c.i.f. nom.
Manganese Ore (43%-45%)		69d./71d. c.i.f. nom.
Manganese Ore (38%-40%)		nom.
Molybdenite (85%) basis		10s. 0d. per lb. (f.o.b.)
Titanium Ore—		
Rutile Australian 95/97% TiO_2 (prompt delivery)		£29 10s./£30 per ton c.i.f.
Ilmenite Malayan 50/52% TiO_2		£11 10s per ton c i.f.
Ilmenite Travancore 58/60% TiO_2		£15/£15 10s. per ton c.i.f.
Wolfram and Scheelite (65%)		98s. 0d./101s. 0d. per unit c.i.f.
Vanadium—		
Fused oxide 95% V_2O_5		7s. 6d./8s per lb. V_2O_5 c.i.f.
Zircon Sand (Australian) 66-67% ZrO_2		£15/£16 15s. ton c.i.f.

the light of E.E.C.'s aim to produce domestically all the aluminium it needs. Last year, E.E.C. imported approximately 200,000 tons from Canada and the U.S.A. These imports represented almost the exact difference between the Group's total consumption of 691,000 tons and its own production of 488,000 tons, indicating an almost exact balance between imports and exports in the inter-European trade between the Community and non-member countries. Within the Community itself aluminium production capacity is rising even more rapidly than consumption, and output is expected to reach an annual rate of 615,000 tons by the end of 1961. Taking a longer view, however, consumption in the Community, with its present membership, is currently inceasing at a rate of approximately 7 per cent annually. At this rate, if maintained, it should amount to around 1,000,000 tons by 1965.

*

The Swedish concern AB Svenska Metallverken, since earlier this year sole owner of Sweden's only aluminium producer AB Svenska Aluminiumkompaniet, has now formally announced its expansion plans for aluminium production capacities. An initial investment of 60,000,000 Swedish crowns is considered as necessary to raise capacity by over 100 per cent from the current level of 13,800 tonnes to 29,000 tonnes annually.

The new plant required for this expansion will be ready for use by about the end of 1963. It is announced simultaneously from Zurich that the Aluminium-Industrie-AG of that city is to supply technical aid and know how to the Swedish concern, which will instal a set of AIAG-designed electrolysis furnaces.

NEW DIAMOND LABORATORY

In both the U.S. and in South Africa considerable effort is being devoted to the development of new uses for diamonds in industry. As Mr. Oppenheimer stated at the official opening of Ultra High Pressure Units Ltd. at Springs (near Johannesburg) last month, before General Electric's discovery the use of diamond abrasives was limited by the supply, and research and development to find new uses for diamonds were inhibited by this consideration. This situation has been completely changed by the advent of synthetic grit manufactured first by General Electric and more recently by de Beers as well.

A new diamond application development laboratory facility has now been put into operation by the Metallurgical Products Department of General Electric. Its aims are to investigate new and improved diamond applications, to evaluate new G.E. man-made diamond types, and to analyse comparative performance testing operations. Among many investigations currently in progress at the laboratory are: evaluation of man-made diamond grinding hardened steels; (2) determination of the feasibility of using diamond in plate glass grinding, and (3) evaluation of the performance of manufactured diamond in blades for masonry cutting applications.

CHILEAN IRON ORE MINING

The Chilean Minister of Mines, in a recent speech, stated that the improvement in American iron ore prices has resulted in Chile's growing iron ore mining industry, exports from the small and medium mines rising from 237,000 tons, valued at U.S.$1,300,000 in 1954, to nearly 4,500,000 tons (U.S.$30,100,00) in 1960. Bethlehem Chile Iron Mines Co. was the largest producer, with an annual production of some 1,500,000 tons, of which 600,000 tons were processed by the Huachiapatao steel mill. Second place was taken by the Cia. Minera Santa Fe, which produced about 1,100,000 tons in 1960, and exported 2,400,000 tons.

Of 1960's iron ore production, the U.S. took 78.4 per cent of the total, followed by Western Germany taking 11.6 per cent and Japan 4.5 per cent.

The Japanese are developing the iron ore mine at Las Adrianitas, and have contracts with Cia. de Acero del Pacifico and the Cia. Minera Santa Fe, which will expand exports to Japan. The Minister, commenting on the present system of taxation, recommended that mining companies should get tax privileges to encourage their development. The funds that the large mining companies must return to Chile to cover production costs in the first half of 1961 have been calculated as follows: Chile Exploration Co. U.S$23,500,000; Braden Copped Co. U.S.$17,200,000; and Andes Copper Mining Co. U.S.$11,600,000.

AEC's NEW URANIUM CONTRACT

The Atomic Energy Commission has signed a new contract with Homestake-Sapin Partners of Grants, New Mexico, for the supply of 16,862,000 lbs. of uranium concentrates valued at $135,000,000. The Commission said the uranium would be supplied by two mills

GENERAL MANAGER

SOUTH AMERICAN MINING COMPANY

Large international company is seeking a general manager for an important mining operation on the west coast of South America. The successful applicant will be the resident chief executive of the South American organization with responsibility for all segments of the business. He should possess: organizing ability, technical know-how, Spanish language. The position presents an exceptional opportunity and challenge. Generous compensation commensurate with qualifications.

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in the Grants area between September 1, 1961, and January 1, 1967.

U.S. METALS OUTLOOK FOR 1962

Reports made to the National Association of Business Economists at a recent meeting in Chicago indicate that in the U.S. expenditure will be higher during 1962 at all levels from the consumer to the Federal Government, and good prospects for metals are foreseen.

According to Mr. William P. Carlin, director of research for Republic Steel Corporation, steel production could rise in 1962 by 10—15 per cent to about 112,000,000 ingots tons, despite possibilities of a strike during the year.

Mr. Irving Lipkowitz, Director of economic affairs for Reynolds Metals, told the association that the outlook for non-ferrous metals was quite good. Lead-zinc problems, he stated, were being worked on by nearly everyone concerned with these metals and efforts to find new markets for them were being greatly increased. The industry had been helped by the improvement in the galvanised market, but this gain had been slightly counteracted by the decreased usage of lead-zinc in die casting.

Of copper, Mr. Lipkowitz said that U.S. shipments and consumption had risen by about 10 per cent, stocks were down, and the domestic price was reasonably stable. The only uncertainties in the copper industry were the unstable situations in African copper-producing areas and possible labour disputes in Chile.

On the subject of aluminium, Mr. Lipkowitz said that consumption of this metal in 1961 was about 5 per cent better than in the previous year and nearly as high as that of the peak year 1959. He predicted that next year ingot production would rise from the present 77 per cent of capacity to about 90 per cent.

CANADA'S SILVER OUTPUT LOWER, ASBESTOS UNCHANGED

Compared with last year's record production, Canada's output of silver this year has declined. During the first eight months of 1961 output totalled 20,328,490 ozs. (21,843,459 ozs.). August output fell to 2,223,460 ozs. from July's total of 2,390,238 ozs. and 2,650,110 ozs. in August, 1960.

Exports of refined silver, during the first five months of 1961, totalled 4,347,681 ozs. (5,426,910 ozs.). During the January-May period, silver content of concentrates exported totalled 4,252,734 ozs. against 4,241,018 ozs.

*

Canadian asbestos supply and demand are expected to be more or less balanced during the 1962 season. This prediction was made by Mr. Karl V. Lindell, chairman of the Canadian Johns Manville Company. Since November last year, the company's main operation at Asbestos, Quebec, and at its mine Munro, Northern Ontario, have been operating for six days a week, on which basis they have been able to meet all demands. No significant change is foreseen for 1962, but there might be improvements in the Canadian and U.S. markets which would absorb some of the oversupply still persisting in the Thetford area, Quebec. The company will probably have some excess capacity in 1963, when the Advocate mine in Newfoundland reaches production.

U.S. FLUORSPAR OUTPUT

During the second quarter of 1961 America's domestic mine production of crude fluorspar ore totalled 134,000 tons and mills processed 118,000 tons from which 43,200 tons of finished fluorspar was recovered, according to the U.S. Bureau of Mines. Total production of finished fluorspar was 47,568 tons which included almost 4,400 tons of material marketable as mined. Finished fluorspar shipped, including 5,300 tons of material marketable as mined, totalled 48,900 tons valued at $2,229,176.

Imports for consumption were higher than during the same period in 1960 and during the second quarter of 1961 the consumption of fluorspar increased 12 per cent over the corresponding period last year. The total amount of fluorspar imported during the second quarter of 1961 totalled 147,101 short tons valued at $3,868,491 and included entries for consumption and withdrawals from bonded storage. This was two per cent greater in tonnage and less than one per cent lower in value than in the second quarter of 1960.

At the end of the second quarter stocks of finished fluorspar at mines and mills were about 9 per cent lower than at the end of the first quarter. Consumers held about 9 per cent less fluorspar in stock at their plants than at the end of the first quarter 1961, although their stocks were reduced by 18 per cent from the beginning of the 1961 first quarter.

NEW U.S. PLANT FOR UPGRADING MINERALS

The Minerals and Chemicals Philipp Corporation has announced that is expected to open a new $2,000,000 mineral processing plant in McIntyre, Georgia, early next year. The plant is being built to operate a flotation process which the company has adapted for upgrading minerals and ores to secure greater yields per ton. The plant will have a multi-ton per hour capacity using a process that was originally developed to improve kaolin clays by floting out discolouring minerals. The company believe that they can adapt this process to recover commercial quantities of various metallic and non-metallic- substances from tailings down dumped at mine sites —phosphate, low-grade bauxite, low-grade Mesabi iron ores, Utah beryllium ores, fluorspar, Bolivian tin ores and uranium. The company state that their methods will be open to licensing.

U.S. MAGNESIUM OUTPUT DECLINES

The commercial production of primary magnesium in the U.S.A. is down, according to the latest figures released by the U.S. Bureau of Mines.

Output during the third quarter of this year was 9,130 tons against 10,365 tons during the second quarter.

Producers' shipments during the third quarter were 12,330 short tons against 12,360 during the second quarter while shipments during the first nine months of the year were 38,055 tons against 38,510 —a decline of 455 tons.

Copper · Tin · Lead · Zinc

(From Our London Metal Exchange Correspondent)

Stocks in L.M.E. official warehouses at the beginning of the week followed last week's pattern in that there was a fall in the case of copper but rises in the case of tin, lead and zinc.

MT. ISA STRIKE ENDS

Copper stocks in L.M.E. official warehouses fell by 126 tons to 15,089 tons. On the L.M.E. prices have remained comparatively steady with a backwardation of about 10s. The market does no more than jog along from day to day with very little outside interest. Something fresh in the way of incentives is considered necessary before prices can move upwards. U.K. stocks of copper at the end of September have been given by the British Bureau of Non-ferrous Metal Statistics as 147,948 tons, compared with 152,898 tons at the end of August.

During the week a final agreement on wages was signed by representatives of employers and workers at the El Salvador and Potrerillos plants and the possibility of a strike is consequently ruled out. At Mount Isa members of all unions have now decided to resume work and the eight weeks' strike there is now over.

From Tucson, Arizona, it is learned that Asarco has now officially opened its new Mission Mine. The current rate of production at this mine is 45,000 s.tons annually, bringing Asarco's annual production from all sources to 200,000 s.tons Asarco is continuing to search for other copper ore deposits in Arizona and other areas, an indication of confidence in the outlook for copper.

All U.S. custom smelters are now quoting 24¼ cents per lb. for scrap copper; previously two smelters had reduced their price to 24½ cents per lb. Copper sales by E.N.A.M.I. for the account of small Chilean producers during the past week totalled 259 tons.

FURTHER FALL IN TIN PRICES

Tin stocks in L.M.E. official warehouses rose by 11 tons to 4,346 tons. On the L.M.E. the cash price has fallen during the week by about £7 and the forward price by about £6 10s. The contango keeps steady at about £6 10s.—£7 10s. Demand on both sides of the Atlantic is quiet, whilst over-hanging the market is the coming sale by the G.S.A. of a further 850 tons of Grade "A" and 25 tons Grade "B" Longhorn tin.

U.K. stocks of tin at the end of September have been given by the British Bureau of Non-ferrous Metal Statistics as 7,662 tons compared with 8,350 tons at the end of August. The U.S. Bureau of Mines has stated that tin consumption in the U.S. in September was 6,480 l.tons compared with 7,210 l.tons. in August. Total U.S. industrial tin stocks increased from 39,730 l.tons on September 1 to 41,800 tons on September 30.

In the first half of November shipments from Penang were 3,504 tons and from Singapore 2½ tons. This compares with 2,249 and 7½ tons respectively in the first half of October.

On Thursday the Eastern price was equivalent to £972⅝ per ton c.i.f. Europe.

LEAD RECOVERIES ON CONTINENTAL BUYING

Lead stocks in L.M.E. official warehouses rose by 910 tons to 11,619 tons. On the L.M.E. prices fell sharply when this figure was known but lower prices brought in both U.K. and Continental buyers, and the loss has since been more than recovered. The contango has remained steady at about 25s. At the moment there is nothing of sufficient interest to affect prices either way.

U.K. stocks of lead at the end of September have been given by the British Bureau of Non-ferrous Metal Statistics as 74,273 tons, compared with 74,876 tons at the end of August. The U.S. Bureau of Mines reports domestic mine output of recoverable lead in August as 21,500 s.tons compared with 20,800 s.tons in July; the total for the eight months of 1961 is given as 177,100 s.tons.

From Tokyo it is learned that Japan has decided to cut her lead output of 1,000 tons in the first quarter of 1962. Japan is a leading importer of lead and produces no more than about 7,500 tons per month. The small cut is being made in deference to the agreement reached at last month's International Lead and Zinc Conference.

ZINC MARKET DULL

Zinc stocks in L.M.E. official warehouses rose by 308 tons to 11,157 tons. On the L.M.E. prices have risen slightly with a contango of about 25s. The market generally has been featureless. U.K. stocks of zinc at the end of September have been given by the British Bureau of Non-ferrous Metal Statistics as 64,491 tons compared with 70,637 tons at the end of August. In the United States zinc stocks dropped in October to the lowest level for 18 months and at 150,000 tons represent about six weeks' supply based on latest figures of domestic shipments. Production in October was the highest since January, 1958.

*

Mr. John L. Kimberley, Executive Vice-president of the American Zinc Institute said that 1962 car models are scheduled to carry ten per cent more zinc than the 1961's.

OFFICIAL TURNOVERS

Official turnovers (in l.tons) for the week ending November 17, 1961, with the previous week's figures in parentheses, are:—

Copper	12,750	(13,600)
Tin	1,880	(1,970)
Lead	12,250	(7,800)
Zinc	10,550	(8,775)

Closing prices are as follows:

	November 16		November 23	
	Buyers	*Sellers*	*Buyers*	*Sellers*
COPPER				
Cash	£229	£229¼	£229¾	£230
Three months ..	£228¾	£229	£229¼	£229½
Settlement ..	£229¼		£230	
LEAD				
Current ½ month	£58⅜	£58½	£61⅜	£62
Three months ..	£59½	£59⅝	£62½	£63
TIN				
Cash	£963½	£964½	£960	£961
Three months ..	£970	£971	£967	£968
Settlement ..	£964½		£961	
ZINC				
Current ½ month	£67½	£67¾	£70	£70½
Three months ..	£68⅜	£68¾	£71⅛	£71½

Mining Finance

Stoping at Mufulira West

In 1956 the Mufulira West scheme was agreed, and during the past year the expansion has reached its final stages, stoping has begun and it is anticipated that the project will be completed by June next year. This £14,000,000 expansion is designed to increase the capacity of Mufulira by about 50 per cent and will make it one of the world's largest copper producers.

In his statement, extracts from which are published on page 558, Sir Ronald Prain has drawn attention to the financing of the Mufulira West scheme. In total the scheme was estimated to cost £14,300,000 of which £2,000,000 was attributable to housing and was, therefore, financed under separate arrangements. Of the balance £7,000,000 was raised by a debenture issue in 1957 whilst the remainder was to be found from the internal resources of the R.S.T. group. At June 30, 1961, £8,700,000 had been spent on the scheme and it is anticipated that the balance will be incurred during the current year.

Although the expansion scheme is designed to increase the capacity by some 50 per cent the operating profits of Mufulira should increase by an even greater proportion. This is due to two factors. The operating costs have, for some time, been carrying the additional costs of development in the western section and thus have been unduly high on a unit basis. The increased throughput will not only eliminate this additional charge—which should perhaps have been placed against a suspense account—it will also directly reduce unit costs in the normal manner. With the present costs at Mufulira standing at £161.77 per ton electro this is a rosy picture indeed, even at the present copper prices. However, it must not be overlooked that, in the early stages, a proportion of these profits will not be available for distribution. It is essential that the resources of the company that have been used in the expansion should be ploughed back.

With the increased capacity Mufulira should be able to produce 128,000 tons in the current year though if it is necessary to continue the curtailment of production then this would be reduced to 115,000 tons. The curtailment of production was introduced on a voluntary basis in October, 1960, and at present is at a rate of 10 per cent of capacity. It is interesting to compare the different methods that have been adopted by the two Rhodesian groups.

Rhoanglo, discussed here last week, decided to maintain production levels whilst operating a 10 per cent cut on sales, the balance being diverted to stockpiles. The mines of the R.S.T. group have actually cut production back by 10 per cent, modifying their mining policies in order to make the best of this situation. At Roan Antelope the mill grade was reduced from 1.85 per cent to 1.79 per cent which enabled the mine to achieve a better overall extraction rate. At Mufulira the proportion of ground drawn from open-stoping was reduced from 24 to 13 per cent. Again the overall mine grade was dropped from 2.65 to 2.40 per cent and this enabled more low-grade ground to be drawn from the caving areas leaving the higher grade open-stoping areas until required.

This policy reflects the American trend in mining economics, which proposes that during periods of reduced demand and lower prices it is the lower grade areas that should be worked. This is not always possible but the present copper market conditions provide a classic situation.

In all three of the R.S.T. group mines the unit production costs have increased during the past year. This is mainly due to the reduced production but a further factor has been the wage increases made to all categories of African employees throughout the year. Ticket-paid employees received an increase of 30s. per ticket (30 working shifts) and monthly-paid employees received 45s. per month. The agreements included wage stand-still clauses of 16 to 18 months. Thereafter, however, it must be anticipated that there will be further demands for increases, particularly from the lower categories of ticket-paid employees.

The dual effect of the increased unit costs and the reduced sales levels has resulted in an overall reduction in profit levels. At Mufulira the profit after taxation has fallen from £5,654,107 to £4,262,336; at Roan Antelope from £4,112,413 to £2,739,362 and at Chibuluma from £1,734,074 to £1,046,560. At the Ndola Copper Refineries the profit for the year increased from £348,918 to £529,472 as a result of the increased tonnage refined.

In the quarterly reports for the quarter

OPERATING RESULTS OF COPPERBELT COMPANIES

Company	*Year to June 30*	*Copper Sales*	*Depreciation*	*Taxation*	*Net Profit after Tax*	*Transfers to Reserve*	*Gross Divs. per ord. share*
		(£000)	(£000)	(£000)	(£000)	(£000)	s. d.
Rhoanglo							
Nchanga	1960*	42,623	—	7,780	13,644	1,500	11 2.4
	1961*	40,721	—	7,770	12,450	1,000	11 6.8
Rhokana	1960	27,689	—	3,930	11,534	758	11 2
	1961	24,336	—	3,420	10,956	258	11 6.8
Bancroft	1960	11,292	—	—	3,693	—	1 7.2
	1961	10,422	—	—	2,745	—	1 3
R.S.T.							
R. Antelope	1960	22,309	1,200	2,740	4,112	1,500	1 3
	1961	18,767	1,200	2,000	2,739	750	1 0
Mufulira	1960	25,633	1,000	3,300	5,654	1,600	7 10½
	1961	23,391	900	2,565	4,262	1,300	6 0
Chibuluma	1960	5,386	250	—	1,734	1,725	—
	1961	4,225	200	—	1,047	1,050	—

* Year to March 31.

ended September 30, 1961, the output at Mufulira has returned to its level of twelve months ago, the increased capacity having offset the 10 per cent cut-back; the operating costs have also returned to the earlier level of £154.9 per ton. At Roan Antelope the production for the quarter is 19,709 tons compared with 20,280 tons in the June quarter with unit costs slightly up at £170.5 per ton. At Chibuluma the production is considerably down with proportionate increases in unit costs but it is not anticipated that this will affect the target production of 17,500 tons for the year.

LOCANA'S SPECIAL FUNCTION

Locana Corporation is not a mining finance company in the accepted sense of the word. Its main function is that of finding suitable openings for investment, especially in the Canadian mining field, for its clients. These clients, who comprise major financial institutions, investment trusts and large mining groups, are, in fact, the shareholders of Locana. These shareholdings are, however, relatively nominal for the Locana Corporation itself does not hold a substantial investment portfolio; the investments of the Locana 'Group' being held directly by the individual shareholders. The main example of this is the 'group's' holding in the McIntyre Porcupine-Ventures mining group which in total is very substantial although the holding of Locana Corporation itself is relatively modest.

In addressing the shareholders the chairman, Mr. N. D'Arcy, has pointed out that the group now controls assets capitalised at over $600,000,000. This has been built up over the past five or six years and it is notable that this investment by the British firms, which make up the Locana group, has prevented several important Canadian mining companies from passing to alien control.

Although Locana was initially concerned with finding investment opportunities in Canada and this remains its main function, it is also actively developing business in Britain and Western Europe. It is concerned with the development of Sipelec, the French investment trust which specialises in the electrical industry.

A most important aspect of the Locana policy is that in seeking investment opportunities the objective is not to control but rather to hold important minority equity interests. Looking to the future this is a very important aspect, the Locana group can become a very important mining finance agent not only in Canada but throughout the world and smaller mines will look to Locana for both finance and advice in the knowledge that if an investment were made it was not simply a device to gain control.

C.P.M.O. AND THE INDIAN GOVERNMENT

As yet the final agreement between the C.P.M.O. and the Indian Government has not been settled but the discussions have now reached an advanced stage and the directors have published their report for the year ended December 31, 1960. In this report the arrangements between the company and the Indian Central Government and the State governments of Maharashtra and Madhya have been outlined. These arrangements are essentially the same as those given in our note of October 13 (page 382) which was based on a report in *The Statesman* of Calcutta.

The main proposals are that, with the exception of one mining area, all interests in the remaining mining areas will be transferred to a new Rupee company. In the initial stages the C.P.M.O. will have a 49 per cent interest in this company whilst the Central and State governments will subscribe for the balance in cash. The new company will also acquire, in exchange for shares, a large portion of Central Provinces' fixed assets and stores.

The stocks of manganese will not be transferred to the Rupee company; these will be disposed of in conjunction with the ore produced by the new company on a proportionate basis. Excluding the stores, but taking the stock of manganese ore at cost, the net current assets as at December 31, 1960, were worth £2,006,297, or 13s. 5d. per share. On the basis of the current London market price of 18s. the fixed assets and stores can be valued by difference at £700,000. This is obviously a gross undervaluation and is the result of the heavy discount to which the shares have been subjected due to the uncertainty. It is to be sincerely hoped that the valuation of these assets for the purposes of the governments cash subscription will not be based upon market valuation.

For details of the arrangements, shareholders must await the chairman's statement. However, points that will be of particular interest will be the basis of the valuation and the question of the management of the new company. The annual meeting will be held on December 15 in London.

THE LIFE OF RENONG

In his annual statement, published on page 560, Sir John Hay has made special reference to the life of the Renong property. The No. 3 unit at Rasa is now at the end of its available area and is working on month to month basis, but overall the property has a life of between 8 and 10 years.

The No. 3 dredge, which has been in operation since 1914, is to be replaced by a second-hand dredge acquired in October, 1960. At present this unit is being adapted and it should commence operating at Kuala Kubu Lama, in the Rasa mine area during the current year. It will be working together with the No. 2 dredge which, although also built in 1914, continues to give satisfactory service.

During the past financial year the dredge on the Jinjang property, the most modern of the company's dredges, has been operating under difficult conditions. The clayey nature of the ground has been a problem and the uneven formation of the bedrock has added to the difficulties. During the first half of the year the dredge actually worked at a loss and as this dredge is the main contributor to the company's revenue this has had a serious effect upon the overall results. The dredge moved into better ground during the second part of the year but the improved results were insufficient to outweigh the earlier losses, even with the higher tin price.

The profits for the year, after depletion and taxation, were £26,638 compared with £42,872 for the previous year. The proposed dividend of 9d. per unit of stock, maintained at the previous level, will absorb £26,250.

The buffer stock contributions, which stand in the accounts at £37,500, have now been repaid together with a figure of £10,059 which represents Renong's share of the profit realised by the Buffer Stock Management. Renong is now making contributions to the Second Buffer Stock.

In the current year, with improved operations at Jinjang and the introduction of the second dredge at Kuala Kubu Lama, the overall results should be considerably better, though against the profits must be set the balance of the expenditure incurred in adapting the second-hand

(Continued on page 561)

London Market Highlights

South African gold shares became a disappointing market this week. Interest soon waned after the previous revival and although there was little profit-taking, share prices began to sag. Even a subsequent demand in the U.S. and Canada for gold shares failed to give the market here a fillip. Western Holdings at 121s. 3d. lost 3s. 10½d. of the previous advance and St. Helena came back 2s. 6d. to 66s. 10½d. Western Deep "A" held up well, however, at 38s. 9d. on continued hopes of initial production next month. Also better at 29s. were Stilfontein in anticipation of better development values.

The Gold Fields rights issue news was a particularly well-kept secret, and its release during the closing dealings on Friday of last week caught the market off its guard. The share price was lowered further to 61s. 10½d. but started to recover after the week-end. Ghanaian issues suffered from a new attack of political anxieties on reports of further arrests in that country. Consolidated African Selection Trust fell 10½d. to 16s. 10½d. while Ashanti eased to 9s. 6d. at which price the latter's yield is over 21 per cent.

The wealth of information issued over the week-end in the shape of annual reports, quarterlies and chairman's statement from the Rhodesian Selection Trust group made no more impact on the copper share market than had a similar cluster of information issued a few days earlier by the Anglo American group. Share prices were virtually motionless as far as the Copperbelt issues were concerned. The Australian Mount Isa did no more than ease a few pence to 54s. on news of the return to work at the mine. Also easier were Messina at 12s. 9d. following the disappointing final dividend.

Tin shares became dull after the previous week's steady rise. There was little in the way of fresh company news to stimulate the market and occasional London profit-taking coupled with some Singapore sales soon produced a long list of price losses. Sungei Besi, which had been particularly sought after in the previous week relapsed 2s. 6d. to 46s. 6d. and Ayer Hitam were similarly lower at 47s. Despite vague talk of a pending capital return coupled with the fact that the shares appear to have fallen out of line with the rest of this market, Tanjong fell 2s. 9d. to 24s. 6d.

A good feature elsewhere was the jump of 3s. to 18s. 6d. in Central Provinces Manganese, following news of proposed partnership with the Indian Government.

RHODESIAN SELECTION TRUST GROUP OF COMPANIES

Companies in the Group are incorporated in either Northern Rhodesia, Southern Rhodesia or Bechuanaland.

The following is an abridgment of the statement dated October 20, 1961, by the Chairman, Sir Ronald L. Prain, O.B.E., which has been circulated to members :—

Production of copper from the group's three mines during the year which ended on June 30 last was 202,041 long tons compared with 217,057 long tons in the previous year. This reduction was due to the policy of curtailing production to which I refer later. The average price received for copper was lower than the previous year. Sales amounted to £46,383,800 compared with £53,328,539.

Operations showed a total profit of approximately £15 million before making reserves or allowing for taxation, compared with the corresponding figure of approximately £20 million in the previous year.

The group production was made up as follows:—

	long tons
Mufulira	101,036
Roan Antelope	81,805
Chibuluma	19,200
Total	202,041

In October, 1960, the group decided to curtail production at the rate of 10 per cent per annum as its contribution towards correcting the over-supply position of copper which existed at that time. At the time of writing conditions have not justified a return to full production. In comparing our production for the year ended last June with that of the previous year two points should be borne in mind. The first is that the production cut was operative for only nine months of the financial year; the second is that, in accordance with usual practice in the copper industry, our cut was applied to the increasing capacity of the group and not to a static base-line. Thus, although our final figures for the year appear to show a curtailment of something less than 10 per cent, in fact the 1960-61 production, after making allowance for these two factors, was almost exactly 90 per cent of the capacity which existed throughout the year.

There were virtually no interruptions to production during the year.

The average price at which all our copper was sold was about £231 per ton which compares with £246 per ton in the previous year. Nearly all our sales were made on the basis of London Metal Exchange prices, which were easier during the year, reflecting the comfortable supply position as compared with the previous year.

Ore Reserves

The published ore reserves of the group as at June 30, 1961, are as shown below:—

		Grade	
	short tons	*per cent total copper*	*per cent cobalt*
Mufulira	182,205,000	3.35	—
Roan Antelope ...	93,429,000	3.00	—
Chibuluma	9,657,000	4.59	0.15
Baluba (undeveloped)	112,000,000	2.41	0.16
Chambishi (undeveloped)	35,000,000	3.37	—
Total	432,291,000		

The Copper Market

On the production side of the international market the main features of the past year were the relative absence of interruptions due to strikes in the producing areas, and the degree of voluntary curtailment of either production or sales which was undertaken by most of the major producers. In referring last year to our decision to cut production at the rate of 10 per cent I mentioned that the disequilibrium between production and consumption of primary copper in the free world was due less to a falling off in consumption than to steadily increasing production, including the bringing in of certain new mines.

During the past year the consumption of copper was satisfactory. In fact, 1960 was a record year, and the increase in consumption, especially in Europe, was at a rate which had not previously been equalled in any twelve months' period.

As a result of the voluntary curtailment on the one hand and the satisfactory consumption on the other, the year saw an improvement in the balance between production and consumption, though at the end of the financial year there was still some degree of over-production. The comfortable supply position was reflected, as I have already mentioned, by a somewhat lower average price on the London Metal Exchange. The variation on the Exchange was actually from £260 10s. 0d. per ton to £216 10s. 0d. per ton, with an average of £232 14s. 5d. per ton. This represents a range of £44 per ton which compares with a range of £70 per ton in the previous year.

Since the end of the financial year there have been strikes in Chile and U.S.A., and political troubles in or near the African producing areas. Despite these features the London Metal Exchange price in the first quarter of this financial year remained relatively steady at an average of £230 per ton and at the time of writing is £230 15s. 0d. per ton.

Looking forward, first on production, much will depend on whether supplies are to be affected in the coming months. by further strikes in any of the producing areas. It is also of interest to note that many of the large-scale expansions or new enterprises which were embarked upon some years ago under the impetus of the high copper prices prevailing in the mid-1950's have now been completed. Those that remain to be completed are all scheduled to be finished within the next two or three years. In the absence of any announcements as to fresh mining activities, it would appear that the great increases in copper production which we have seen since the mid-1950's may not be equalled again in the next few years, though I have no doubt that taking a longer view the copper mining industry will continue to expand in line with requirements.

As far as consumption is concerned, there is no reason to suppose that it will not continue to be satisfactory, especially on the basis of the present level of prices which is conducive to continued growth in copper usage. Much will depend, however, on general business activity in the United States and the United Kingdom in the coming winter. Most producers would welcome the opportunity for a return to full production or sales, and no doubt will continue to watch the position closely. In my opinion decisions affecting curtailment should be based on the facts of the statistical position rather than on any short-term price movements.

Customers for our copper now number 61 covering 19 countries.

I now turn to the affairs of the individual companies:

ROAN ANTELOPE COPPER MINES LIMITED

Mainly because of the combined influences of the cut in production, higher unit costs arising therefrom and lower copper prices, profits at £4.74 million fell by about 30 per cent as compared with those of the previous year. Higher rates of taxation, to which I refer later, further widened the comparison as net profits at £2.74 million were about a third down on the previous figures.

However, profits recommended as dividends at £1.97 million represented only a 22.2 per cent decrease on the previous year as it has been possible to reduce the transfer to general reserve by more than half. This year's figure of £700,000 for general reserve makes provision for our commitments for investments in exploration companies carrying out prospecting programmes, stock valuation changes and a further contribution towards sums which we are committed to lend to the Federal Government in respect of development finance. This year's transfer is lower than that of the previous year mainly because financing of the company's investment in Ndola Copper Refineries Limited was completed a year ago.

It is worth pointing out that last year was the first in the company's history when the whole output was produced in the form of electrolytic copper.

The date on which I am signing this statement is the 30th anniversary of the first production of copper at Roan Antelope, which was the first of the present mines on the Copperbelt to come into production.

During these 30 years Roan Antelope has produced approximately 2.1 million tons of copper. I should like to take this opportunity of thanking and congratulating all those whose devoted care, attention and services have helped to make Roan Antelope the great mine it is today.

NDOLA COPPER REFINERIES LIMITED

Last year was the busiest since the company commenced operations three years ago and production amounted to nearly 86,000 tons. The whole of the production of Roan Antelope Copper Mines was handled, representing 91 per cent of the throughput.

These operations resulted in a profit of £529,000, which is just over a 50 per cent increase on the 1959/60 figure.

I am glad to be able to say that this satisfactory result, apart from the reason of increased turn-over, reflects lower costs of operations through improved plant efficiencies.

A transfer to general reserve of £250,000 has been made to finance capital expenditure and towards providing working capital. The dividend proposal of 10 per cent gross represents a 72 per cent increase on last year's payment.

MUFULIRA COPPER MINES LIMITED

Production at 101,036 tons was only slightly down on the previous year despite the curtailment which operated for the whole of the last three quarters of the financial year. However, the production in fact represents a curtailment of 10 per cent on an increasing capacity during those nine months. The increased capacity arises from the gradual introduction of production from the Mufulira West project which is expected to be completed in June next year. The increasing capacity this year should enable Mufulira to produce 128,000 tons but should it be necessary to continue curtailment at the present rate throughout the year the output would be held at about 115,000 tons. In addition we may need to build up some small stock for pipeline requirements based on the higher production rate.

Gross profits at £6.83 million were 23.8 per cent below those of the previous year due mainly to the lower copper prices. Costs of production were only slightly higher than those reported for the previous year.

Net profits were about 25 per cent down on previous figures as provision for taxation was affected by the higher rates of taxation. The lower net profit is reflected in lower dividends at £2.90 million which is also about 25 per cent below the dividends paid for the previous year.

Mufulira West

I think it is appropriate at this time to make some general comments about the Mufulira West project. This scheme, which was agreed upon in 1956, is an integral part of the Mufulira mine complex, and is designed to add about 50 per cent to the productive capacity of Mufulira. The capital cost was originally estimated at £16 million. Subsequently it was decided not to increase the size of the refinery for the time being, as it was considered that suitable opportunities would occur to sell the increased production in the form of fire refinable copper. The capital cost was thus reduced to £14.3 million and of this figure, £2 million, which represented expenditure on housing, was financed under separate arrangements. Thus the sum of £12.3 million was left to be found by the company.

Shareholders who have followed my statements over the past few years will recollect that the board decided to make a debenture issue of £7 million which was arranged in 1957. The balance was to be found from the internal revolving cash resources of the company. To June 30, 1961, £1.7 million had been spent on the scheme over and above the £7 million represented by the debenture issue. It is expected that the balance of expenditure will be incurred in the coming year.

I feel I must also say something about the prospects of this scheme on the earning power of the company.

In the first place, it will be necessary to utilise some of the early profits arising from the expansion to plough back cash into the general resources of the company which have been used for the purpose of financing the expansion, as I have already explained. Shareholders must not therefore expect that the full profits arising from Mufulira West will be immediately available for distribution.

In the second place, when the expansion scheme is completed it is expected that at current copper prices there will be a significant reduction in the overall unit costs of Mufulira. As a consequence it is estimated that at current prices of copper the 50 per cent increase in output would be represented by more than a 50 per cent increase in the gross profits of the company.

I trust that shareholders will consider it satisfactory that this major expansion scheme looks like being achieved without calling on shareholders to subscribe any new money, and that the prospects are that the scheme will be commissioned on the original time schedule. I also hope, in a year's time, to be able to confirm that the scheme will have been accomplished within the original cost estimates.

It may be of interest also to note that at present the Mufulira West expansion scheme is one of the two largest uncompleted expansion projects that we know of in the copper industry, and it is a larger project than any of the new mines which are at present under development in various parts of the world.

CHIBULUMA MINES LIMITED

Profits amounted to £1,047,000 as compared with the previous year's profit of £1,734,000. Reduced production, lower prices and higher costs all contributed to the decrease in profits. However, mainly because of the reduction in costs of production, cobalt profits amounted to £27,000 as compared with £12,000 for the previous year, notwithstanding a reduction in sales because of pipeline build-up.

No tax payment is due on this profit on account of the Federal tax laws applying to new mines. Except for a small amount of carry forward, all the available profit amounting to £1,050,000 has been transferred to general reserve to finance capital expenditure, as I mention below.

Under the terms of our loan agreement with the United States Government we are required to pay in each year in the form of metal a value equivalent to 75 per cent of the previous year's net profits, after adding back interest payable. The balance remaining on the loan as at June 30 last amounted to £406,488, and as 75 per cent of 1960/61 profits is in excess of this figure our loan will be extinguished during the current financial year. Chibuluma will thus have fully complied with its loan obligations, and in fact will have paid off its whole loan more than a year ahead of the final date for repayment.

With the final repayment of the United States Government loan in sight, this may be a convenient opportunity to recapitulate the financial position of the company. Capital expenditure, it is estimated, will amount to about £7.54 million, of which the sum of £1 million was provided by the shareholders as equity capital. To date £6.06 million has been ploughed back out of profits which leaves £480,000 to be provided out of future profits. There is also the question of providing for working capital. It, therefore, appears that the whole of the current year's profits will be required for internal financing purposes.

Cobalt

Cobalt matte production at the refinery at Ndola showed an increase on that of the previous year at 11,065 short tons, representing a recoverable content of 1,785,000 lbs. of cobalt metal. Part of the production was absorbed in building up pipeline stocks.

RHODESIAN SELECTION TRUST LIMITED

The total revenue for the year amounted to £1,875,000 represented predominantly by dividends payable by Mufulira Copper Mines Limited. Administration, sundry expenses and interest payable reduced this to a net profit of £1,779,000. No taxes are payable on this profit as it consists mainly of taxed income. The equivalent net profit a year ago was £2,398,000.

The board has allocated £250,000 to general reserve to take care of the company's commitments towards the continued prospecting programmes on the Baluba and Chambishi properties, and also certain expenditure on prospecting elsewhere. In addition, this figure includes the sum of £100,000 as a further instalment towards the cost of the shares purchased last year in the Mufulira, Chibuluma, Chambishi and Baluba companies, as mentioned in my statement last year.

MISCELLANEOUS

Company tax rates in the Federation were increased in the last Federal budget from 7s. 6d. to 8s. 0d. in the £. These increased rates apply to the previous year's profits as well as to the current year's profits. In addition, last February the Federal Government introduced legislation extending control to all exchange and currency transactions. As I informed shareholders at informal meetings last April, this legislation does not affect shareholders who are non-residents of the Federation.

FEDERATION OF RHODESIA AND NYASALAND

Last year, and the year before, I devoted a considerable section of my statement to an assessment of the position in the three territories which make up the Federation of Rhodesia and Nyasaland. I considered it my duty to bring home to shareholders the realisation that their investment is in a country, and in a continent, where political changes are occurring with rapidity.

I do not propose to go back over this ground, but I consider it again my duty to bring shareholders up to date as to the present position, because the local political and economic situation is of great importance to the future of these companies on at least three grounds: first, from the point of view of the orderly continuity of our industry in conditions which will enable us to play our part in the copper business of the world; secondly, from the point of view of future expansion of the industry, especially if such expansion should require, as it undoubtedly would, fresh investment from overseas; thirdly, from the point of view of the value of our business, as expressed in the valuation of our shares on the world markets.

At present our shares are standing at prices which reflect the political uncertainty in this part of the world. It is not within the power of the boards of these companies to wave any magic wand which would enable the share valuations to reflect the normal industrial merits of this investment. The political climate must obviously continue to be a factor in the eyes of overseas investors, and this is a factor over which we have no control.

It is important, therefore, to outline briefly the present political and economic situation in the Federation.

On the political side the facts are, at

the time of writing, that so far as Nyasaland is concerned the first election has been held under the constitution agreed in 1960, and it has resulted in Africans assuming a large measure of control over the political affairs of the country. In Northern Rhodesia a new constitution has yet to be finalised and, presuming that this is finalised within the next few months, it is expected that an election under such constitution will take place some time around the middle of 1962. It would be idle to speculate on the possible outcome of such an election until the final details of the constitution are known.

In Southern Rhodesia a referendum held in July among the voters, predominantly European, endorsed by a two to one majority a new constitution which was drafted in February, and an election under this constitution will probably take place during the second half of 1962. It is certain that after such an election Africans will take their place for the first time in the Southern Rhodesian Parliament.

Finally, there remains the question of the Federal constitution. The first talks on this subject were held in London last December but postponed until more was known of the territorial constitutions. At the time of writing it has not been announced publicly when the Federal talks will be resumed, but presumably this will be during 1962.

Shareholders will see from the foregoing brief summary that there are still many hurdles to be overcome before it can be said that the political future of these territories for the next few years is one that can be readily assessed. Federation is a great concept, and it is to be hoped that the negotiations over the next twelve months will result in the continuance of the Federal principle, even if, as I indicated last year, substantial changes may be necessary to enable it to gain general acceptance.

In the field of the economy, while it has been inevitable that the position has suffered from political uncertainty, it must not be thought that investment in the country is at a very low ebb. Borrowing from abroad dropped substantially in 1959 and 1960 and is likely to remain low in 1961, but overall investment in 1960 was in fact slightly higher in real terms than in the first year of Federation. This was due largely to the investment of local savings, including continued heavy investment by the mining companies. Even at the present level investment is sufficient, by international per capita standards, to provide an increasing standard of living for a rapidly growing population.

Moreover, the Federation has what is, by African standards, a sophisticated banking and financial system which reflects the relatively advanced industrialisation of these territories as compared with others in tropical Africa. It is necessary to appreciate this degree of industrialisation if investors are to understand some of the political problems which it raises, by comparison with the far less developed countries in tropical Africa with a predominantly agrarian economy. The banking and financial system to which I have referred should prove of considerable help in maintaining the economy at times such as the present, and thus indirectly in assisting a difficult political situation by ensuring that the maximum buoyancy is preserved in the economy.

The inter-relationship of politics and the economy is axiomatic. In the last two years, however, another factor has entered into our considerations. While it is obvious that political events in Africa as a whole will have a profound influence on our affairs here, it is only recently that violent changes have occurred in countries which border the Federation. In particular the situation which exists in the Congo has caused the gravest uneasiness in the territories of the Federation. It is too much to hope that there can be a quick solution to the problems of the Congo, and until more is known of this it will be necessary to qualify one's assessment of the immediate future of events here, even if the various constitutions to which I have referred can be settled in the next year. One can only express the hope that the political solutions in the Congo as well as in the Federation will be based on the realities of a continent which is emerging into political consciousness, under world pressure, at a rate so much faster than anything which applied in the past. The determination of indigenous peoples to assume an increasing share in the political affairs of their countries is one of the strongest human and political forces of the 20th century, perhaps the outstanding historical feature of our times. It is a factor which must be faced squarely, and dealt with realistically if changes are to occur on an orderly basis.

As far as these companies are concerned, as I have stated in earlier statements, we take no part in party politics, and we support no political party. We regard our main job as that of producing copper with the maximum efficiency under our conditions, and thereby giving the greatest possible assistance to the economy which depends to such an unusual extent on the mining industry. Our industry has, I think, a record of moving with the times. It has been in the forefront of creating full opportunity for employees, irrespective of race, to advance, and has given practical expression wherever possible to the concept of racial partnership on which the Federal constitution is based.

I have tried in previous years to show that the copper mines of Central Africa have become a vital part of the structure of modern civilisation and that disturbance to their operations would not only be a disservice to the world industries which they serve, but also a disaster to the countries where they operate. The prospects of the copper market will call before long for a further opening up of the great reserves which still exist in Central Africa. Interference with these mining operations, whether by physical, political or fiscal measures, would prejudice the chances of obtaining the capital which will be essential for such expansion, for these countries have but limited internal resources.

I firmly believe that both European and African political leaders here are fully aware of the consequences which such interference would bring, and that they realise the great importance of maintaining their country's investment status. It seems, therefore, reasonable to expect that once the new political patterns have emerged in the next year or two there will be a renewed incentive making for the revival of overseas investment, based on the realisation that the continuance and expansion of profitable mining operations must be the first consideration of governments if the future prosperity of the people who live in Central Africa is not to be seriously retarded.

THE RENONG TIN DREDGING COMPANY

RECOVERIES IMPROVING

ENCOURAGING START TO CURRENT YEAR

SIR JOHN HAY'S STATEMENT

The forty-eighth Annual General Meeting of The Renong Tin Dredging Company Limited will be held on December 12 in London.

The following is the circulated statement of the Chairman, **Sir John Hay**:

In my statement issued last November with the annual report and accounts I informed Stockholders that the dredge on the Jinjang property had reached ground where tin recoveries were poor, mainly owing to the uneven formation of the bedrock. The cost of dredging land with such unfavourable physical features is high and this dredge actually worked at a loss for the first half of the year. Since Jinjang is the most powerful and modern of our dredges and the main contributor to our revenue, this had a considerable effect on the results for the year. This was only a temporary phase and a not uncommon experience in tin dredging operations. Happily, in this instance the dredge emerged from the unrewarding ground at the beginning of the second half of the year and returns since then have remained profitable.

Despite its age, with some re-equipment, we were able to keep No. 3 Dredge operating for the whole year. This dredge, built as long ago as 1914, is now about finished as a working unit. As I previously advised Stockholders, it is almost at the end of its available ground at Rasa and only continues on a month-to-month basis working its way into small areas at the base of the foothills on the boundary of the original dredging area. It has had a remarkable record of low-cost dredging stretching over nearly half a century and is now to be replaced by a second-hand dredge, acquired in October, 1960, which is of greater capacity and in better structural condition. This unit is in the course of being altered, equipped and adapted to our purpose. Part of this expenditure was incurred in the year under review and the balance will be met in the current year. Fortunately, the outlay is well within our financial competence. We expect this dredge to be operating at Kuala Kubu Lama in the course of the current year and to be yielding profitable results. No. 2 Dredge, which was also built in 1914, is still operating satisfactorily on that site. It has been re-equipped and reconditioned at various times and we anticipate that its operational life will continue for some years to come.

Accounts

What I have already said explains the decline in our profits. Moreover, in the preceding year our revenue was augmented by sales from stocks accumulated over the restrictive period. In the year under review we had no such fortuitous aid and there was no very significant increase in the average price of tin metal for the year.

We are acutely aware of the fact that our tin-bearing area is a wasting asset and, as I stated last year, we have for long been endeavouring to prove and acquire

further mining areas Unfortunately our endeavours have so far not met with success. It is of little satisfaction to us to know that the efforts of large organisations engaged in tin extraction in Malaya have been similarly disappointing. The prudent Stockholder should always bear in mind that dividends from mining concerns, particularly in these circumstances, are to some extent a return of capital. One Stockholder has written suggesting that we make a scrip issue. I doubt whether this would be appropriate in circumstances where our ascertainable life is not much more than eight to ten years. It is appropriate, however, that I should remind Stockholders that we did, in the year 1956, make a return in cash of as much as 3s. per unit of Ordinary Stock.

Buffer Stock Contributions

As you will have observed, these stand in the accounts at a figure of £37,500. This has now been paid in full, plus a sum of £10,059 which represents the Company's share of the profit realised by the Buffer Stock Management. Against this, however, we have been under the obligation from August 1, 1961, to make contributions to the second Buffer Stock, which the Malayan Government will collect by means of a levy on the export of tin concentrates over a period of approximately two years.

Tin Regulation

The first International Tin Agreement ended on June 30, 1961, and its history demonstrates how the assumptions upon which it was based have been falsified by the course of events. Before the Agreement had run its course the predicted surplus of tin was transformed into an acute shortage. A second Agreement has been entered into, but it is largely inoperative and full production continues uninhibited. The present price of tin is, of course, highly profitable and, as such, is no doubt agreeable to Stockholders. But it is only prudent to bear in mind that there is in the U.S.A. an immense stock of tin. Despite the shortage, the Government of that country appears to be reluctant to relieve the situation by releases from this large stockpile. Their action, or inaction, in this respect forms a strange contrast to their decision to release stockpile rubber, a commodity which was already in ample supply. From this contrasting treatment it would appear that it is not economic considerations which weigh with Governments in matters of this kind. It may well be, however, that the U.S.A. Government may yet come to a decision which will have a considerable influence on the course of future tin prices.

Current Prospects

The present year started well and in the four months to date the Board has reason to be well satisfied with the results. If this trend continues, then profits for the year should show a vast improvement on those now submitted.

The London International Engineering Exhibition, the largest international exhibition ever to be held in Britain, will occupy both Olympia and Earls Court from April 23 to May 2, 1963. This will incorporate the Engineering, Marine Welding and Nuclear Energy Exhibition. Information may be obtained from the joint organizers, F. W. Bridges & Sons, and Industrial Trade Fairs.

MINING FINANCE—*Continued*

dredge. The results to date this year are given in the tin table seen below, in the first quarter 261 tons were produced compared with 156 tons in the previous year.

BUFFELS CAPITAL PROGRAMME

In his annual review in 1960 Mr. Jack Scott, the chairman, outlined a seven-year expansion scheme with the associated capital expenditure programme. In his review this year, published on page 562, Mr. Scott has given the progress to date. The No. 1 sub-vertical shaft has been completed to its final depth and has been commissioned, though work is still in progress on the ore and waste passes. Preparation for the sinking of the Eastern twin shafts is well ahead, the main shaft is down to a depth of 138 feet and the concrete headgear has been completed. The ventilation shaft is down to 205 feet.

Although the mill capacity is 200,000 tons per month it is the intention to build the milling rate, from the present level of 157,000 tons, to only 180,000 tons per month. This should be achieved by 1964 when the new Eastern shafts will be operating. The capital expenditure programme over the seven-year period, which will be financed from profits, is expected to average some R4,500,000 per year. This will have a restricting effect upon dividends but it is anticipated that it will be possible to maintain the current dividend rate of 35c., despite the advent of taxation in 1963.

With the mill throughput raised to 180,000 tons and after full taxation, a dividend from gold alone of 40c. is possible and uranium should add a further 5 cents.

WANKIE COLLIERY

It was to be expected that the Kariba hydro-electric scheme would have its effect upon the sale of Wankie coal; in the event, however, it is not as serious as might have been anticipated. This is mainly due to the increasing demand from other users, particularly the Rhodesian Iron and Steel Company.

Sales for the year ended August 31, 1961, amounted to 3,418,934 tons, some 430,684 tons lower than the previous year. As a result, the trading profit fell by £174,570 to £1,381,257. Interest and dividends, however, rose by over £60,000 and with a slightly reduced level of taxation

(Continued on page 564)

Tin Company Outputs and Dividends

Company	Financial year	Tons of Tin Concentrate produced: This financial year to date	Last financial year to date	Last financial year TOTAL	Dividends declared‡: This financial year to date	Last financial year TOTAL
EASTERN						
Ampat†	Dec.	557·8 (10)	705·5	879·3	—	3/7·2d.
Austral Amal.	June	537·0 (3)	502·0	2060·5	—	5/–
Ayer Hitam†	June	315·0 (3)	637·8	1893·8	—	2/–
Berjuntai	April	1809·0 (6)	1303·5	2726·8	—	3/–
Chenderiang†	March	60·5 (6)	52·3	251·8	—	7·5d.
Gopeng Cons.†	Sept.	2071·8 (12)	1467·3	1467·3	—	3/3d.*
Hong Kong Tin†	Sept.	621·5 (12)	304·3	304·3	—	—
Idris H.†	Dec.	300·5 (9)	224·8	339·3	4·5d.	1/6d.
Ipoh Tin†	March	61·8 (6)	200·3	245·8	—	—
Kampong Lanjut	March	1129·3 (7)	1032·3	1948·3	—	—
Kamunting Tin	March	1016·8 (7)	763·3	1591·8	—	2/6d.
Kent (F.M.S.)†	Dec.	303·8 (9)	182·8	267·5	4·5d.	7·5d.
Kepong D.	June	66·0 (3)	76·0	407·5	—	3/–
Killinghall†	Sept.	266·8 (12)	422·5	422·5	—	—
Kinta Kellas	March	101·8 (7)	184·5	286·7	—	1/9d.
Kramat Tin	March	63·0 (7)	392·3	621·3	—	6/–
Kuala Kumpur	March	898·0 (7)	837·8	1523·3	—	8/–
Larut Tin	Dec.	242·8 (10)	54·0	119·5	—	6d.
Lower Perak	April	816·3 (6)	775·0	1260·5	—	2/9d.
Malayan Tin†	June	560·3 (3)	930·5	2751·0	—	2/–
Malaysiam†	March	62·0 (7)	67·6	106·3	—	—
Meru Tin	June	28·5 (12)	36·0	36·0	—	—
Pahang†	July	422·7 (2)	430·6	2538·0	—	1/9d.
Pengkalen†	Sept.	602·0 (12)	391·5	391·5	—	1/7·5d.*
Petaling	Sept.	1356·3 (12)	1129·8	1129·8	—	4·2d.*
Rahmen H.	June	131·3 (4)	102·1	369·8	—	5·6d.
Rambutan†	June	93·3 (3)	43·8	233·5	—	6d.*
Rantau	June	269·3 (4)	249·0	799·0	—	3/3·2d.
Renong	June	261·6 (3)	156·0	832·2	—	9d.
Selayang	Sept.	16·3 (12)	118·5	118·5	—	—*
Siamese Tin† and subsidiaries	Dec.	1968·0 (10)	2084·0	2681·0	1/6d.	2/9d.
S. Kinta	March	2844·8 (7)	2196·3	3896·8	—	(s) 3/0·6d.
S. Malayan†	June	947·0 (3)	819·8	3563·5	—	4/–
Sungei Besi†	March	830·8 (6)	913·3	2012·8	1/3d.	1/6d.*
Sungei Way†	June	474·3 (3)	325·5	1360·0	2·8d.	7·0d.
Tanjong†	Dec.	664·3 (9)	730·0	959·8	2/6d.	4/1·5d.
Tongkah H.	June	680·0 (4)	591·8	309·8	—	3/–*
Tronoh†	Dec.	2521·3 (9)	2576·0	3302·0	2/–	5/3d.
NIGERIA						
Amal. Tin	March	2578·0 (7)	2823·0	4808·0	—	1/3d.
Columbite		502·0	380·0	722·0		
Bisichi	Dec.	497·0 (9)	438·5	636·5	—	6·75d.
Columbite		400·0 (9)	328·0	458·0		
Ex. Lands	Dec.	462·0 (9)	451·0	540·0	—	8·4d.
Gold and Base	Dec.	592·0 (9)	563·0	751·0	—	3d.
Columbite		40·0 (9)	65·0	79·0		
Jantar	Sept.	15·0 (1)	23·5	218·9	—	—*
Columbite		44·4 (1)	23·6	394·6		
Jos Tin	July	11·8 (1)	13·0	151·3	—	—*
Kaduna P.	Dec.	61·5 (10)	64·5	77·5	—	9d.
Kaduna S.	Dec.	239·0 (10)	218·0	266·0	—	7d.
Naraguta K.	Dec.	58·6 (10)	99·3	116·9	—	—
United Tin	March	97·5 (6)	111·0	238·0	—	1·5d.
Columbite		5·5 (6)	12·0	21·0		
MISC.						
Beralt	March	22·0 (7)	36·0	53·0	—	3/–
Wolfram		1237·0 (7)	1200·0	2079·0		
Geevor	March	385·0 (7)	375·0	657·0	—	2/6d.
Rooiberg	June	1134·0 (12)	1103·0	1103·0	—	5/–
S. Crofty	Dec.	647·0 (9)	619·0	856·0	—	—

* Final dividend not declared ; † Tons exported ; ‡ Up to date at time of going to press.
(s) Adjusted for scrip issue.

BUFFELSFONTEIN GOLD MINING COMPANY LIMITED

(Incorporated in the Republic of South Africa)

CHAIRMAN'S REVIEW

The following statement by the Chairman, **Mr. Jack Scott,** was circulated with the Report and Accounts for the year ended June 30, 1961.

The Reports of the Directors and Consulting Engineers indicate that during the year under review there has been continued progress in all aspects of operations at the mine.

The extensions to the Reduction Plant were completed and the average monthly milling rate increased by 4,600 tons to 148,400 tons. A further gradual increase is planned during the current year. The improvement in the recovery grades for both gold and uranium continued.

Despite the restricted sales of uranium the total working profit from gold, uranium and acid increased by R706,202 to R12,860,468. After providing for interest and sundries the total net profit for the year carried to Appropriation Account was R12,355,817 of which R5,450,057 was appropriated for capital expenditure, R1,657,849 was absorbed in the redemption of loans and R3,850,000 was paid out in two dividends, Nos. 7 and 8, each at the rate of 17½ cents per share.

Since the date of the Balance Sheet a further loan instalment amounting to R1,500,000 was paid to the Anglo American Corporation on September 30, 1961.

The results of this year's operations for the four months ended October 31, 1961, show a further improvement in the profit earned from gold production. The milling rate averaged 155,000 tons per month giving recovery grades of 8.79 dwt. per ton and 0.572 lb. per ton, which yielded a total working profit of R3,884,842 of which R814,615 was from uranium and acid.

On the development side, results for the year under review were satisfactory. Developments totalled 109,319 feet of which 27,277 feet were on reef and 27,250 feet were sampled, giving a percentage payability of 93.2 and average values of 650 inch/dwt. and 36.60 inch/lb. I should perhaps mention at this stage that the development figures for the year to June, 1961, include 26,062 feet on the Farm Mapaiskraal which, as indicated in the Directors' Report, is in the process of being included in the mining area.

During the first four months of the current year, development totalled 33,127 feet. Of this 8,291 feet were on reef and of the 8,735 feet sampled, 88.3 per cent proved payable at an average value of 534 inch/dwt. for gold and 37.82 inch/lb. for uranium.

Capital expenditure during the past year has been in accordance with the programme of which full particulars were given in my review last year. It has been mainly concerned with No. 1 sub-vertical shaft and the Eastern Twin Shaft system. The No. 1 sub-vertical shaft was completed to its final depth of 2,845 feet below collar, which is equivalent to 7,535 feet below surface. The shaft is fully equipped and has been commissioned, and work is now in progress on the ore and waste passes and station development.

Good progress has been made on the preparatory work for the sinking of the Eastern Twin Shafts. The 28 foot diameter Eastern Main Shaft has been sunk to a depth of 138 feet. The permanent concrete headgear has been completed and work is in progress on the installation of steelwork in the headgear. The 22 foot diameter downcast Eastern Ventilation Shaft has been sunk to a depth of 205 feet. The sinking headgear has been completed and work is now in progress on the first permanent hoist which will be used initially for sinking this shaft and later for hoisting duties at the Eastern Main Shaft. Full-scale sinking of the ventilation shaft is planned to start at the end of December.

For some time past the capacity of the Pioneer Twin shaft system has been fully extended both as regards hoisting and ventilation. Whilst hoisting duties were relieved to a small extent when the sinking of No. 1 sub-vertical shaft was completed, no appreciable increase in the tonnage hoisted can be expected until the Eastern Ventilation Shaft system is completed, during the middle of 1962.

To enable the present rate of production to be maintained until the Eastern Ventilation Shaft is completed, three new and larger fans were to be installed at the Pioneer Ventilation Shaft during 1961. The first fan installed disintegrated during the commissioning period in June and the programme was delayed three months. Fans of another design are now being installed and the first has been commissioned and is running satisfactorily.

Full particulars of the effect on your company of the radical changes in the Uranium Industry were given to you in a circular last February and the progress since then is adequately reviewed in the Directors' Report. I have nothing to add save to say that the company is producing its revised quota without difficulty and the effect on current profits is as anticipated. Bearing in mind our heavy capital expenditure programme this drop in uranium revenue may necessitate some short-term borrowings from time to time as foreshadowed in my last address. The important result of these uranium changes, however, has been to establish your company as a large-scale producer of uranium until 1970 at a cost of production which should give it an excellent chance of competing successfully in the open market thereafter.

In conformity with the action of most of the other mining companies, application has been made for liquor licences to enable the company to undertake and control the sale of liquor to its Native employees. The conditions under which this difficult problem is to be handled when the Act comes into force next year are still being discussed.

I conclude this review by recording the appreciation and thanks of the Board to the Manager, Mr. F. R. Nott, and his staff at the mine as well as the staffs of the Johannesburg and London offices for their loyal and efficient services.

THE NEW PIONEER CENTRAL RAND GOLD MINING COMPANY LIMITED

(Incorporated in the Republic of South Africa)

The following statement by the Chairman, **Mr. Jack Scott,** was circulated with the Report and Accounts for the year ended June 30, 1961.

The main activities of the Company have again been concentrated in Stilfontein Township, where the building programme in the Civic Centre detailed in the Directors' Report was carried to completion. In addition the negotiations for the Proclamation of Extension No. 4 were successfully concluded. With amenities created through the co-operative efforts of the local authority and the township owners, Stilfontein is now one of the most pleasantly developed towns in the Transvaal. The Civic Centre, in particular, with its compact and traffic-free shopping area, gardens, parking facilities and attractive municipal buildings, is unique.

The lettable accommodation which the Company now owns in the Civic Centre and elsewhere in Stilfontein Township and environs has increased by 60 per cent as compared with the position at the beginning of the year under review. Occupation of the new buildings took place progressively throughout the year and as a result net revenue from rentals and freehold revenue improved from R139,756 in the 1960 financial year to R175,695 in 1961. Even after allowing for some increase in the percentage of vacancies, which has been negligible in the past, a further substantial improvement in revenue from this source can be expected in the current year.

The position in regard to sales of property is unfortunately very different. You will have noted the serious decline in revenue from this source reflected in the accounts. The great changes which have taken place in South Africa's uranium industry during the past year are common knowledge. These have resulted, in the Klerksdorp/Stilfontein area, in the closure of the Stilfontein Joint Uranium Plant, Joint Pumping Scheme and Acid Plant and in the cessation of uranium production at the New Klerksdorp, Babrosco, Ellaton and Afrikander Lease Mines.

The building programme of the local mines in the Stilfontein Townships was in any case slowing down considerably and, with a large number of uranium houses now available for other purposes, it may be expected to remain at a minimum for several years. In addition a number of houses at the smaller mines mentioned have become available in the general market. We can therefore expect a lean period in sales of residential erven.

In regard to what may generally be described as business erven, you have been informed that the Company has come to the end of its present construction programme and in this connection you will remember that last year I expressed the opinion that the time had come for the task of erecting buildings to be left in other hands. I am glad to be able to say that in the near future a start will probably be made, as we have disposed of one stand to a commercial bank, which, I understand, will build its own premises in the near future. This will probably encourage others to follow suit.

We have mentioned in past reports the planning of a drive-in cinema in the south-western corner of the township. During the time that this project was held up by delays in Government Departments,

four drive-in theatres were built in the district and they are now operating. A survey of the position indicates that the drive-in theatre business has reached saturation point in this area. We have accordingly shelved the project and are now negotiating for the sale of the cinema site in the Civic Centre on which a conventional hardtop cinema will be built.

The planning of the light industrial township south of the railway line is still proceeding, but Proclamation is not expected for some time.

In general the short-term outlook for the sale of landed property of any type is unpromising and net revenue from this source, which amounted to approximately R157,000 in 1960 and R58,000 in 1961, may be expected to continue on a downward trend.

These remarks in regard to sales prospects in Stilfontein apply in equal measure to Ellaton Township, where the effect of the final approval of the re-layout of the business area has been counteracted by the uranium developments referred to above.

You will have noticed that the value of the item in the balance sheet headed "Landed Property" has decreased by over R200,000. This was due largely to the sale of township services to the Stilfontein Health Committee during the year and negotiations are in progress for the sale during the current year of further electrical and sewage installations in Stilfontein Extension No. 4, at a figure of approximately R323,000.

Turning now to our major asset, which is our holding of quoted securities, made up mainly of shares in producing mines in the Lucas Block area and financial companies interested therein, you will have noted that our portfolio remained completely unchanged at a book value of R1,796,857. The relative market value, in accordance with the general trend, improved from R5,615,936 at June 30, 1960, to R5,669,750 at June 30, 1961, and again to R5,986,304 at October 31, 1961. The divided revenue showed a 10 per cent decline, mainly as a result of lower declarations by the Hartebeestfontein and Buffelsfontein companies.

In regard to unquoted investments, we disposed of certain holdings as dealt with in the Directors' Report and wrote off the resulting losses, which had been fully provided for in previous years. The provision for losses was slightly increased to an extent which we consider will be sufficient to provide for contingencies.

The building expenditure of the year gave rise to the shortfall in current assets as against liabilities reflected in the balance sheet. As planned this position has been corrected since the year end by the receipt of a long term loan of R500,000 secured by first mortgage over some of the Civic Centre property.

To sum up, the year has presented certain difficulties arising out of the radical changes in the uranium industry as particularly affecting the Klerksdorp/Stilfontein area, and general slackness in the property market, but the net profits available remain substantially unchanged and we have been able to maintain the dividend at 30 cents and to add approximately R52,000 to the unappropriated profits, which now total R442,967.

The Society of Instrument Technology and the Royal Dutch Institute of Engineers are organizing a joint conference, to be held in Amsterdam from April 10-13, 1962.

WANKIE COLLIERY COMPANY LIMITED

(Incorporated in Southern Rhodesia)

COAL SALES MAINTAINED AT SATISFACTORY LEVEL

Mr. P. H. A. Brownrigg's Statement

The following is from the statement by the Chairman, **Mr. P. H. A. Brownrigg**, which has been circulated with the annual report and accounts:

Sales of the Company's products have been maintained at a satisfactory level. Although coal sales of 3,418,934 tons during the last financial year were 430,684 tons less than the previous year, this drop was anticipated and was almost entirely due to the increased availability of Kariba hydro-electric power, and a consequent reduction in coal demand for thermal power stations. Sales to other consumers were, however, generally higher than in 1960, and it is hoped that this trend will continue during the current year.

Supplies to the Rhodesian Iron and Steel Company have shown the largest single increase. Although this is due in part to the operation of their own coke ovens, for which Wankie supplies the coal, the Iron and Steel Company's total demand has risen sharply during the year as a result of an expansion of its activities.

Coke Demand Improved

Coke demand improved during the course of the year, and by the year end, production had been increased to near maximum. Sales for the year, however, showed a small decrease compared with the previous year, but the loss of coke sales to the Rhodesian Iron and Steel Company was largely offset by increased sales to other consumers. Sales of the various by - products were generally higher, particularly the sale of tars used for road building in the Federation and the Katanga. Although sales of building bricks were lower in quantity, sales of refractory bricks were higher, and this resulted in an increase in the value of our total brick sales.

The trading profit for the year, after providing for directors' emoluments and a sum of £588,121 for depreciation and amortisation, was £1,381,257 compared with £1,555,827 last year. Our income from investments, however, continues to rise and this year reached £293,784 compared with £230,790 in the previous year.

The profit for the year, before taxation, was £1,532,373. This is £106,687 less than last year, but in view of the economic conditions the outcome of the year's operations can be regarded as satisfactory. A sum of £570,000 was provided for taxation, of which £35,000 has been transferred from tax equalisation reserve. The rate of income tax applicable to the Company was increased by 6d. to 8s. in the £ during the year, which resulted in an additional tax liability of £35,454 for the year. The profit after tax was £997,373 compared with £1,084,060 last year, and we have again been able to declare dividends totalling 1s. 3d. per share out of current profits.

The acceptance of the new constitutional proposals for Southern Rhodesia has brought a general improvement in political and economic conditions in the country. We can now expect some increase in industrial development and a gradual improvement in demand for your company's products. Although a further small drop in coal sales is likely during the current year, thereafter we estimate that sales should gradually increase.

Cuts in Production

By agreement with the Southern Rhodesia Government the notified average selling price of coal within the Federation has remained unchanged at 20s. per ton for the past two years. As was forecast in 1959, this has resulted in a deficiency revenue at the year end, but the amount of £16,584 is considerably less than was anticipated, and is recoverable in future years in terms of the coal price agreement.

The reduced level of sales has necessitated cuts in production which have tended to increase our costs, but every effort is being made to keep costs to their lowest possible level. We have been able to avoid a price increase for the forthcoming year, and the notified average price of 20s. per ton will remain unchanged for the year commencing November 1, 1961. This may again result in some deficiency of revenue due to the Company, but any such deficiency would be recoverable in the future.

The maintenance of a stable coal price for a three year period, at a time of generally rising costs and wages, is an achievement which reflects great credit on all those at the mine.

Vigorous steps are being taken to increase the sales of coal and other products. While we are continuing our efforts in the export market, there is at present little prospect of achieving sales overseas, and it is therefore mainly in Central Africa that we hope to increase sales. We are especially concerned to promote the increased use of coal in the curing of Rhodesian tobacco, for which its economy and efficiency as a fuel is rapidly being proved. There is also scope for the increased use of coal for domestic cooking and heating.

During the year, industrial agreements between the employers and the existing trades unions covering all employees, irrespective of race or colour, have been promulgated by the Government. It is intended that both European and African mine workers will, for the first time, be represented by one trade union, as is the case at present with officials and salaried staff of all races. This is a significant step in the establishment of sound labour relationships on a non-racial basis and the unions are to be congratulated on their achievement.

Mr. Karl E. Gustafson, chief mining engineer, Pierce Management Corp., has returned to Scranton, Penn., from India, where he has been acting as mining consultant to the World Bank on the loan to the government of India for the private sector coal industry.

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The 14th Liège International Fair, which will be held from May 26 to June 11, 1962, will specialize in four principal sections: mining equipment, metal fabrication, mechanical engineering and electrical engineering. Information regarding this fair may be obtained from the U.K. representative, R. C. Liebman.

MINING FINANCE—*Continued*

it was possible to maintain the dividends at a total of 1s. 3d. per share.

Looking to the future it is anticipated that there will be a further small drop in coal sales during the current year but thereafter sales should gradually increase. As mentioned earlier the growth of the sales volume is expected to stem from new users. The consumption of the Rhodesian Iron and Steel Company has risen sharply and the use of coal in curing tobacco is on the increase. In this field coal has a number of particular advantages as a fuel. The sales of by-products is also on the increase; during the past year the quantity of tar sold for road building was higher and also the sales of refractory bricks showed an improvement.

In the face of generally rising costs and, in particular, rising unit costs as a result of the decreased coal production, it is notable that the price of coal is being maintained at 20s. per ton for the third year. No only is this an important technical achievement, it is also perhaps the greatest factor in the efforts of the company to promote increased uses for coal in the Federation.

MODDER EAST NEAR THE END

The year to June 30, 1961, was one of curtailed operations. The total tonnage milled was reduced from 1,629,000 to 1,043,000 with the consequent rise in working costs. This rise in costs was largely off-set by the increased grade resulting from selective mining and operations remained on a profitable basis.

Looking to the future, however, present development is contributing very little to the rapidly diminishing ore reserve and the chairman has said that unless there is a substantial increase in the gold price in the immediate future, mining operations will not continue for more than a few months. Such an early change in the gold price is extremely unlikely.

Although Modder East has a relatively high par value (R2) much of its attraction as a break-up is eliminated due to the fact that there are insufficient shareholders in favour of making capital returns. Net current assets, including trade investments at cost, are currently worth about 78 cents per share. Plant clean-up has already commenced and during the past financial year some 700 ounces were recovered.

THE DIVISION OF NEW PIONEER'S REVENUE

The New Pioneer Company receives its revenue from three separate sources. The major item is from its investment in the operating mines in the Lucas Block area; the dividends received from these mines in the past year contributed over 68 per cent of the revenue. This item is unlikely to change substantially in the near future, though the market value of these quoted investments has reflected the generally upward trend of the Johannesburg market. The valuation at October 31, 1961, of R5,986,304 compares with R5,615,936 at June 30, 1960.

In the past, the sale of landed property has provided a substantial proportion of the revenue—17.4 per cent in 1960. However, as a result of the changes in the uranium industry a number of the plants in the Klerksdorp/Stilfontein area have closed down and as a result a number of ex-uranium houses have now become available for other uses and the demand for new areas has fallen considerably. This trend has been reflected in the 1961 accounts of New Pioneer where the revenue from the sale of landed property has fallen to 7.4 per cent.

The revenue from net rents and freehold continues to improve and in 1961 represents 22.5 per cent of the total revenue. In his review, published on page 562, Mr. Jack Scott has said that a further substantial increase in the revenue from this source can be expected during the current year. This is mainly due to the completion and occupation of the new buildings which the company owns in the Civic Centre and elsewhere in Stilfontein.

GOLD FIELDS RIGHTS ISSUE

Consolidated Gold Fields have announced that it is their intention to make a rights issue of 1 for 10 at 30s. per £1 ordinary share. The current London price is 62s. This issue will raise some £1,568,000.

The interesting point that rises from this issue is the position of the South African shareholders; under the exchange control regulations it is possible that they will not be able to take up their rights. From the practical standpoint this is perhaps not important for the South African holding probably does not involve more than 15 per cent of the issue and in any case there would be nothing to prevent South Africans from selling their rights overseas, though it would be on the basis of the London price.

The important aspect is that a precedent will be set. One possible answer is for the company to give the South African Government an undertaking to the effect that funds raised in the Republic would be used there.

MESSINA DIVIDEND CUT

Messina's estimated net profit after taxation has fallen from R2,961,800 to R2,191,800 for the year ended September 30, 1961. This figure includes the dividends received from the subsidiary company but does not include the capital profit on the sale of investments and the redemption of loan stock; this item adds R18,800 compared with R329,600 for the previous year.

A final dividend of 16 per cent has been declared bringing the total for the year to 31 per cent. This is 13 per cent lower than the 1960 dividend rate.

LONDON AND AFRICAN

The London and African Mining Trust has changed its name to London and Associated Investment Trust. This change follows the change that has come about in recent years in the spread of its investment portfolio. The largest single item is commercial and industrial, which represents 45 per cent of the company's quoted investments. Mining represents 27 per cent and oil producing companies a further 27 per cent.

Attempts are now being made to find the capital to develop the lead-zinc mine in Eastern Nigeria, in which the company is interested. Even at the present low prices for lead and zinc the mine would be a profitable operation and although these metals are currently in over-supply the mine would be valuable to the economy of the Eastern Region, which has officially shown itself willing to make a substantial contribution to the capital. No indication of the total capital that would be required has been given.

Financial News and Results

Standard Beryllium.—Over 80 per cent of the issued and outstanding stock of Lajo Mines has been acquired by Standard Beryllium. The Lajo Mines produce silver with lead and zinc as by-products.

Le Nickel S.A.—The French company which mines nickel in New Caledonia, Le Nickel S.A., has made a scrip issue of 1 for 10. It is also making a rights issue of 2 for 5 at a cost of 55NF per 50NF share. These two issues will raise the total capital from 77,490,000NF to 116,235,000NF.

Selection Trust Dividend.—An interim dividend of 3s. per unit of stock, less income tax, has been declared. This compares with the interim dividend of 1s. 9d. declared last year when the total payment was 7s. 6d.

Sungei Way Dredging.—The payment of a final dividend of 10 per cent has been recommended. An interim dividend of 10 per cent with respect to the current year has also been declared. The annual meeting will be held on December 16, in Kuala Lumpur.

Meru Tin.—The preliminary statement of accounts shows that a loss has been made on the company's operations for the year ended June 30, 1961. No dividend has been recommended.

President Brand. — Borehole S.P.10, situated some 10,600 feet south of the No. 2 shaft has intersected the basal reef at depths between 4,807 feet and 4,810 feet. The first intersection gave values equivalent to 267 inch-dwt. whilst two deflections gave values of 229 inch-dwt and 440 inch-dwt. The reef width was between 35.6 and 39.5 inches.

Ayer Hitam Preliminaries.—The profit for the year after all charges, including taxation, is £365,160 compared with £231,357 for the previous year. A final dividend of 9d. per share has been recommended bringing the total for the year to 2s.

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Mr. Jack Drummond Rudd has been appointed a director of De Beers Consolidated Mines Ltd.

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The British South Africa Company announces that Sir Frederick Crawford, who recently joined its board has been appointed resident director in Africa and will be stationed in Salisbury, Southern Rhodesia. This will increase to three the number of the company's directors who reside in Africa, the others being Viscount Malvern and Mr. H. F. Oppenheimer.

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The new issue of *Quin's Metal Handbook*, 46th edition, comprising 648 pages, has been published by the Metal Information Bureau, price £1 15s. As with past editions, every effort is made to bring the information covering numerous countries, relating to prices, production, consumption and other details up-to-date. The official Soviet Union foreign trade statistics, which were introduced last year, are again included.